GA-H97-Gaming 3

User's Manual

Rev. 1001

12ME-H97GM3-1001R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: **Bullenkoppel 16, 22047 Hamburg, Germany**

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-H97-Gaming 3**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

Signature: Timmy Huang

(Stamp)

Date: May 9, 2014

Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

Responsible Party Name: **G.B.T. INC. (U.S.A.)**

Address: **17358 Railroad Street**
City of Industry, CA 91748

Phone/Fax No: **(626) 854-9338/ (626) 854-9326**

hereby declares that the product

Product Name: **Motherboard**

Model Number: GA-H97-Gaming 3

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: May 9, 2014

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Documentation Classifications

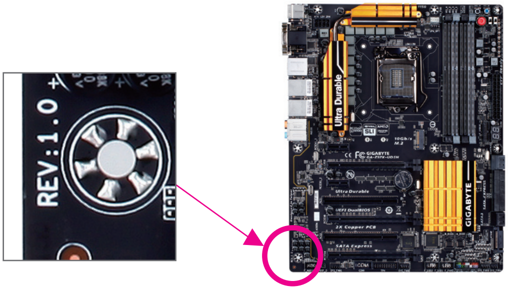
In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

- For detailed product information, carefully read the User's Manual.
- For product-related information, check on our website at: http://www.gigabyte.com

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:



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Box Contents

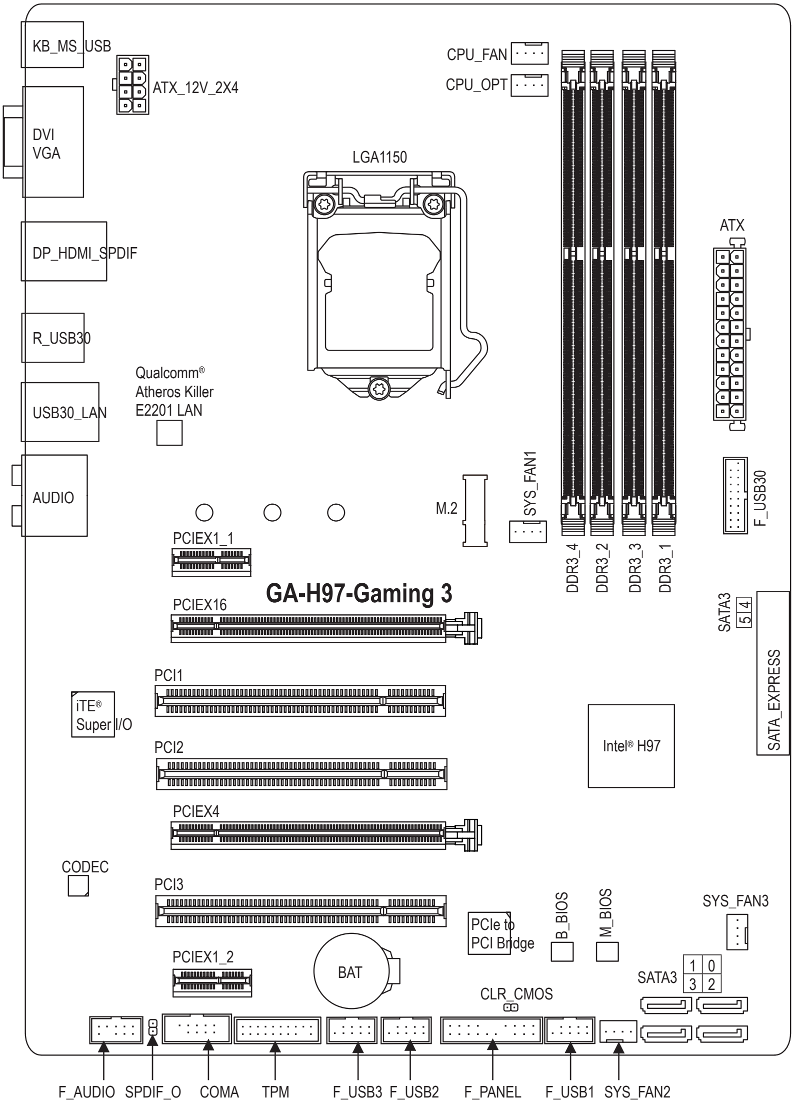
- ☑ GA-H97-Gaming 3 motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ Four SATA cables
- ☑ I/O Shield

The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

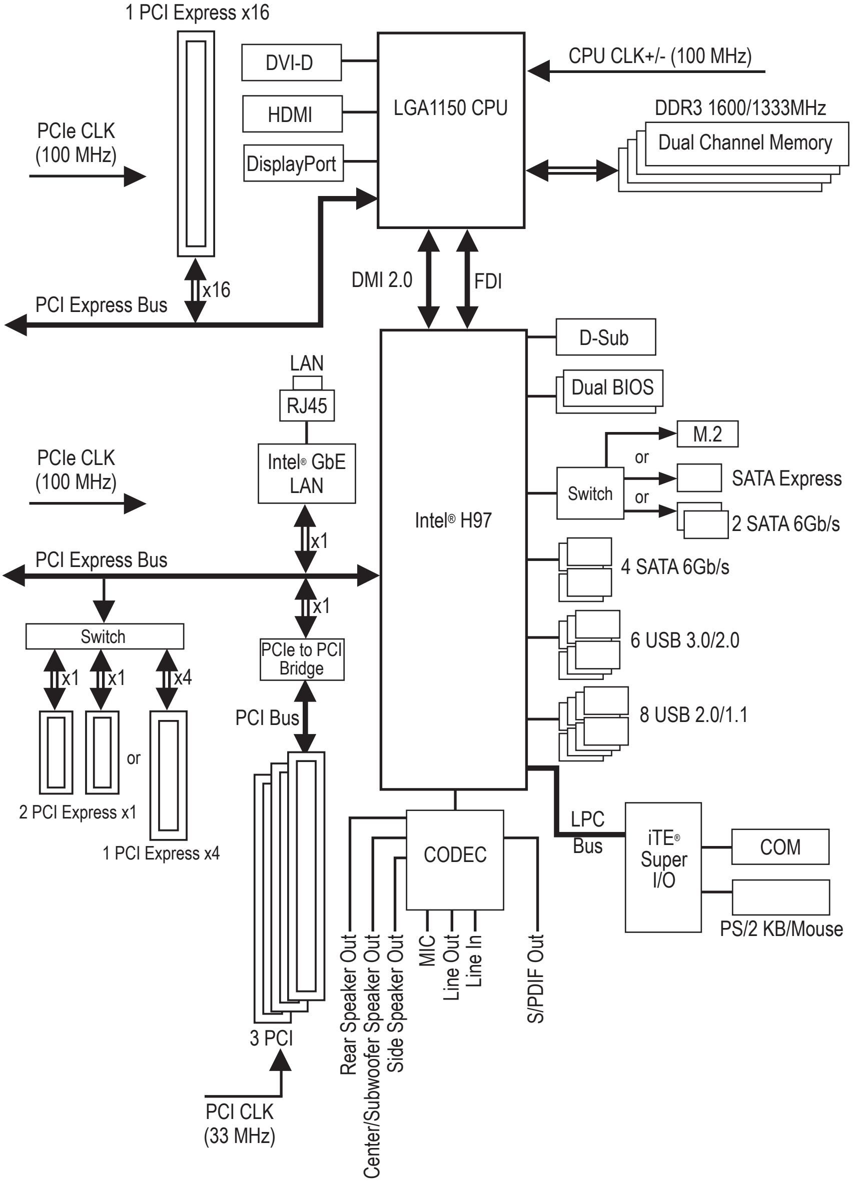
Optional Items

- ☐ 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-6*R)
- ☐ eSATA bracket (Part No. 12CF1-3SATPW-4*R)
- ☐ 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CR1-FPX582-2*R)
- ☐ COM port cable (Part No. 12CF1-1CM001-3*R)
- ☐ HDMI-to-DVI adapter (Part No. 12CT2-HDMI01-1*R)

GA-H97-Gaming 3 Motherboard Layout


KB_MS_USB
ATX_12V_2X4
CPU_FAN
CPU_OPT
DVI
VGA
LGA1150
DP_HDMI_SPDIF
ATX
R_USB30
Qualcomm®
Atheros Killer
E2201 LAN
USB30_LAN
AUDIO
SYS_FAN1
M.2
F_USB30
PCIEX1_1
DDR3_4
DDR3_2
DDR3_3
DDR3_1
GA-H97-Gaming 3
PCIEX16
SATA3
5 4
PCI1
SATA_EXPRESS
iTE®
Super I/O
Intel® H97
PCI2
PCIEX4
CODEC
PCI3
B_BIOS
M_BIOS
SYS_FAN3
PCIe to
PCI Bridge
PCIEX1_2
BAT
SATA3
1 0
3 2
CLR_CMOS
F_AUDIO
SPDIF_O
COMA
TPM
F_USB3
F_USB2
F_PANEL
F_USB1
SYS_FAN2

GA-H97-Gaming 3 Motherboard Block Diagram


1 PCI Express x16
DVI-D
HDMI
DisplayPort
LGA1150 CPU
CPU CLK+/- (100 MHz)
DDR3 1600/1333MHz
Dual Channel Memory
PCIe CLK
(100 MHz)
x16
PCI Express Bus
DMI 2.0
FDI
D-Sub
Dual BIOS
LAN
RJ45
Intel® GbE
LAN
M.2
or
Switch
SATA Express
or
2 SATA 6Gb/s
PCIe CLK
(100 MHz)
x1
Intel® H97
PCI Express Bus
4 SATA 6Gb/s
x1
Switch
x1
x1
x4
PCIe to PCI
Bridge
6 USB 3.0/2.0
PCI Bus
8 USB 2.0/1.1
or
2 PCI Express x1
1 PCI Express x4
LPC
Bus
CODEC
iTE®
Super
I/O
COM
PS/2 KB/Mouse
Rear Speaker Out
Center/Subwoofer Speaker Out
Side Speaker Out
MIC
Line Out
Line In
S/PDIF Out
3 PCI
PCI CLK
(33 MHz)

For detailed product information/limitation(s), refer to "1-2 Product Specifications."

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/Intel® Celeron® processors in the LGA1150 package (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
Chipset	◆ Intel® H97 Express Chipset
Memory	◆ 4 x DDR3 DIMM sockets supporting up to 32 GB of system memory * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. ◆ Dual channel memory architecture ◆ Support for DDR3 1600/1333 MHz memory modules ◆ Support for non-ECC memory modules ◆ Support for Extreme Memory Profile (XMP) memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆ Integrated Graphics Processor: - 1 x D-Sub port, supporting a maximum resolution of 1920x1200@60Hz - 1 x DVI-D port, supporting a maximum resolution of 1920x1200@60Hz * The DVI-D port does not support D-Sub connection by adapter. - 1 x HDMI port, supporting a maximum resolution of 4096x2160@24Hz or 2560x1600@60Hz * Support for HDMI 1.4a version. - 1 x DisplayPort, supporting a maximum resolution of 4096x2160@24Hz or 3840x2160@60Hz * Support for DisplayPort 1.2 version. - Support for up to 3 displays at the same time - Maximum shared memory of 1 GB
Audio	◆ Realtek® ALC1150 codec ◆ Support for Sound Blaster X-Fi MB3 ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF Out
LAN	◆ Qualcomm® Atheros Killer E2201 LAN chip (10/100/1000 Mbit)
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16) (The PCIEX16 slot conforms to PCI Express 3.0 standard.) * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. ◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4) * The PCIEX4 slot shares bandwidth with the PCI Express x1 slots. The PCI Express x1 slots will become unavailable when a PCIe x4 expansion card is installed. * When installing a x8 or above card in the PCIEX4 slot, make sure to set PCIE Slot Configuration (PCH) in BIOS Setup to x4. (Refer to Chapter 2, "BIOS Setup," "Peripherals," for more information.) ◆ 2 x PCI Express x1 slots (The PCIEX4 and the PCI Express x1 slots conform to PCI Express 2.0 standard.) ◆ 3 x PCI slots

Multi-Graphics Technology	◆ Support for 2-Way AMD CrossFire™ technology
Storage Interface	◆ Chipset: - 1 x M.2 PCIe connector - 1 x SATA Express connector - 6 x SATA 6Gb/s connectors (M.2, SATA Express, and SATA3 4/5 connectors can only be used one at a time. The SATA3 4/5 connectors will become unavailable when an M.2 SSD is installed.) - Support for RAID 0, RAID 1, RAID 5, and RAID 10
USB	◆ Chipset: - 6 x USB 3.0/2.0 ports (4 ports on the back panel, 2 ports available through the internal USB header) - 8 x USB 2.0/1.1 ports (2 ports on the back panel, 6 ports available through the internal USB headers)
Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 1 x M.2 PCIe connector ◆ 1 x SATA Express connector ◆ 6 x SATA 6Gb/s connectors ◆ 1 x USB 3.0/2.0 header ◆ 3 x USB 2.0/1.1 headers ◆ 1 x CPU fan header ◆ 1 x water cooling fan header (CPU_OPT) ◆ 3 x system fan headers ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x serial port header ◆ 1 x Trusted Platform Module (TPM) header ◆ 1 x S/PDIF Out header ◆ 1 x Clear CMOS jumper
Back Panel Connectors	◆ 1 x PS/2 keyboard/mouse port ◆ 1 x D-Sub port ◆ 1 x DVI-D port ◆ 1 x HDMI port ◆ 1 x DisplayPort ◆ 4 x USB 3.0/2.0 ports ◆ 2 x USB 2.0/1.1 ports ◆ 1 x RJ-45 port ◆ 6 x audio jacks (Center/Subwoofer Speaker Out, Rear Speaker Out, Side Speaker Out, Line In, Line Out, Mic In)
I/O Controller	◆ iTE® I/O Controller Chip

Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/CPU OPT/System fan speed detection ◆ CPU/System overheating warning ◆ CPU/CPU OPT/System fan fail warning ◆ CPU/CPU OPT/System fan speed control * Whether the fan speed control function is supported will depend on the cooler you install.
BIOS	◆ 2 x 64 Mbit flash ◆ Use of licensed AMI UEFI BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
Unique Features	◆ Support for APP Center * Available applications in APP Center may differ by motherboard model. Supported functions of each application may also differ depending on motherboard specifications. - @BIOS - EasyTune - EZ Setup - Fast Boot - Game Controller - ON/OFF Charge - Smart TimeLock - Smart Recovery2 - System Information Viewer - USB Blocker ◆ Support for Q-Flash ◆ Support for Smart Switch ◆ Support for Xpress Install
Bundled Software	◆ Norton® Internet Security (OEM version) ◆ Intel® Rapid Start Technology ◆ Intel® Smart Connect Technology ◆ Intel® Smart Response Technology
Operating System	◆ Support for Windows 8.1/8/7
Form Factor	◆ ATX Form Factor; 30.5cm x 21.4cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

* Please visit the Support & Downloads\Utility page on GIGABYTE's website to check the supported operating system(s) for the software listed in the "Unique Features" and "Bundled Software" columns.

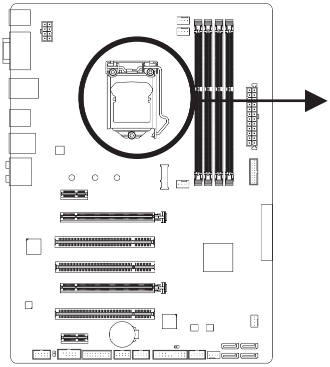
1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU:

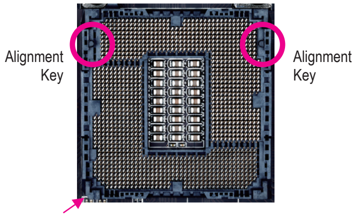
- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

1-3-1 Installing the CPU

A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.

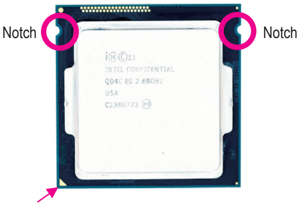


LGA1150 CPU Socket



Pin One Corner of the CPU Socket

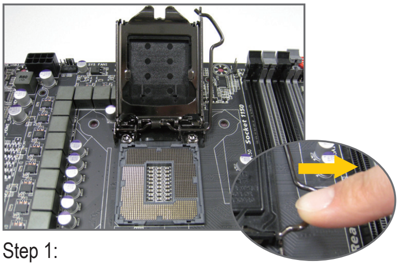
LGA1150 CPU



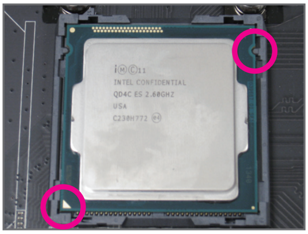
Triangle Pin One Marking on the CPU

B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

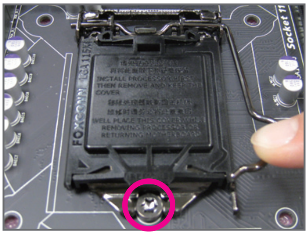
- **Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.**
- **To protect the socket contacts, do not remove the protective plastic cover unless the CPU is inserted into the CPU socket. Save the cover properly and replace it if the CPU is removed.**



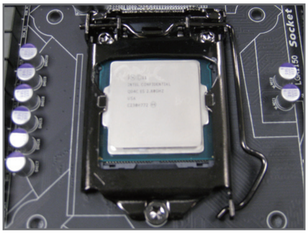
Step 1:
Gently press the CPU socket lever handle down and away from the socket with your finger. Then completely lift the CPU socket lever and the metal load plate/plastic cover will be lifted as well.



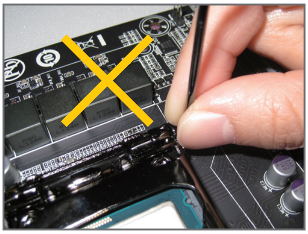
Step 2:
Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.



Step 3:
Once the CPU is properly inserted, carefully replace the load plate. When replacing the load plate, make sure the front end of the load plate is under the shoulder screw. Then press the CPU socket lever. The protective plastic cover may pop off from the load plate during the process of engaging the lever. Remove the cover. (Save the cover properly and always replace it when the CPU is not installed.)



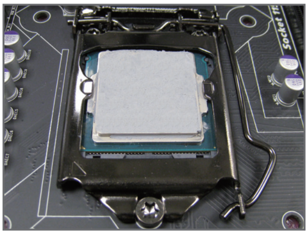
Step 4:
Finally, secure the lever under its retention tab to complete the installation of the CPU.



NOTE:
Hold the CPU socket lever by the handle, not the lever base portion.

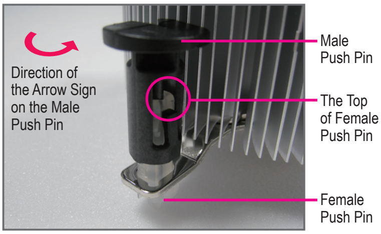
1-3-2 Installing the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)



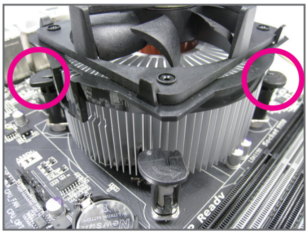
Step 1:

Apply an even and thin layer of thermal grease on the surface of the installed CPU.


Direction of the Arrow Sign on the Male Push Pin
Male Push Pin
The Top of Female Push Pin
Female Push Pin

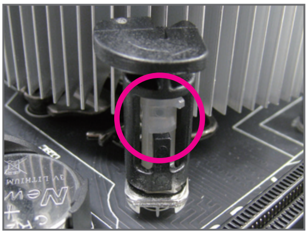
Step 2:

Before installing the cooler, note the direction of the arrow sign ↪ on the male push pin. (Turning the push pin along the direction of arrow is to remove the cooler, on the contrary, is to install.)



Step 3:

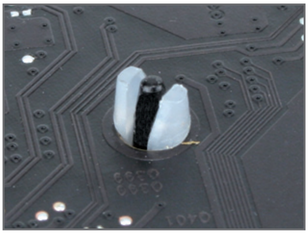
Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



Step 4:

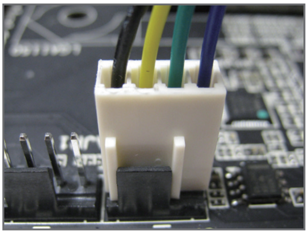
You should hear a "click" when pushing down each push pin. Check that the Male and Female push pins are joined closely.

(Refer to your CPU cooler installation manual for instructions on installing the cooler.)



Step 5:

After the installation, check the back of the motherboard. If the push pin is inserted as the picture above shows, the installation is complete.



Step 6:

Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Memory

Read the following guidelines before you begin to install the memory:

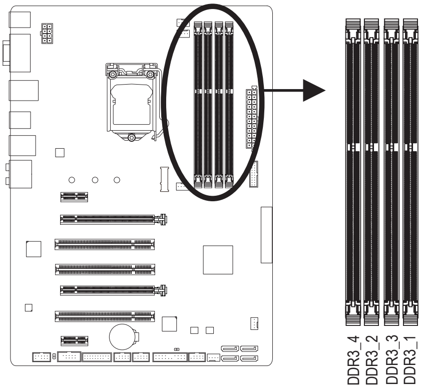
- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
  (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-4-1 Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

- Channel A: DDR3_2, DDR3_4
- Channel B: DDR3_1, DDR3_3



Dual Channel Memory Configurations Table:

	DDR3_4	DDR3_2	DDR3_3	DDR3_1
Two Modules	- -	DS/SS	- -	DS/SS
	DS/SS	- -	DS/SS	- -
Four Modules	DS/SS	DS/SS	DS/SS	DS/SS

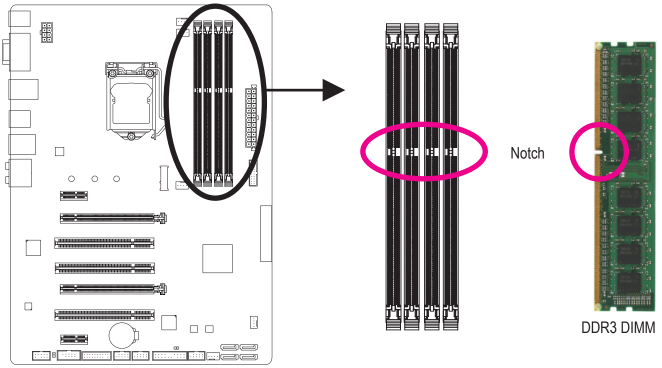
(SS=Single-Sided, DS=Double-Sided, "- -"=No Memory)

Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode.

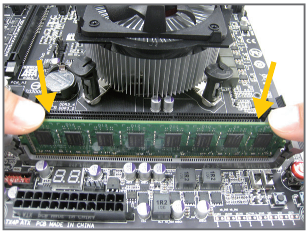
1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.

1-4-2 Installing a Memory

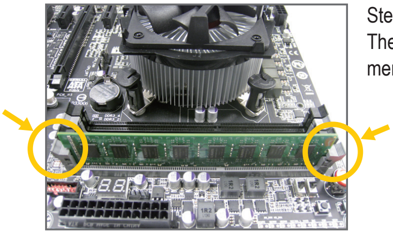
Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard.



A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



Step 1:
Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket.

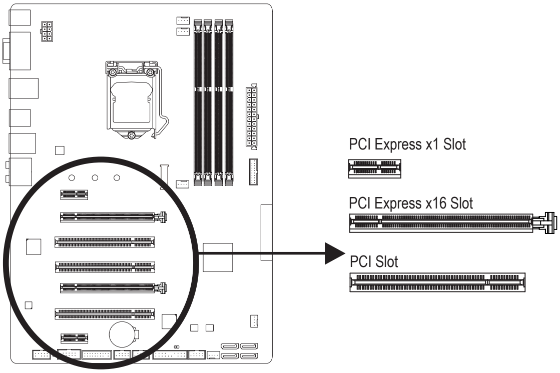


Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

1-5 Installing an Expansion Card

Read the following guidelines before you begin to install an expansion card:

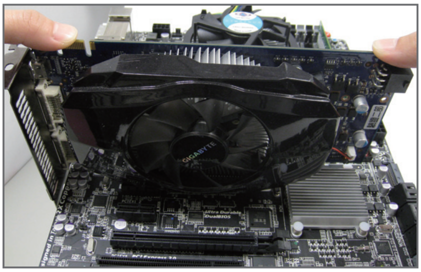
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.



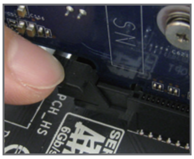
Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

Example: Installing and Removing a PCI Express Graphics Card:

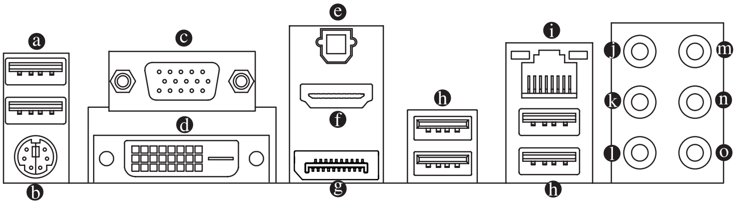


- Installing a Graphics Card:
  Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.



- Removing the Card:
  Gently push back on the lever on the slot and then lift the card straight out from the slot.

1-6 Back Panel Connectors



ⓐ USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓑ PS/2 Keyboard/Mouse Port

Use this port to connect a PS/2 mouse or keyboard.

ⓒ D-Sub Port

The D-Sub port supports a 15-pin D-Sub connector and supports a maximum resolution of 1920x1200@60Hz (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports D-Sub connection to this port.

ⓓ DVI-D Port (Note)

The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 1920x1200@60Hz (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-D connection to this port.

ⓔ Optical S/PDIF Out Connector

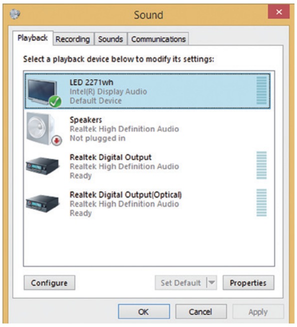
This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector.

ⓕ HDMI Port

HDMI™ HIGH-DEFINITION MULTIMEDIA INTERFACE

The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160@24Hz or 2560x1600@60Hz, but the actual resolutions supported are dependent on the monitor being used.

After installing the HDMI device, make sure to set the default sound playback device to HDMI. (The item name may differ depending on your operating system. The screenshot below is from Windows 8.1.)



Select a playback device below to modify its settings:

LED 2271wh
Intel(R) Display Audio
Default Device

Speakers
Realtek High Definition Audio
Not plugged in

Realtek Digital Output
Realtek High Definition Audio
Ready

Realtek Digital Output(Optical)
Realtek High Definition Audio
Ready

In Windows 8.1, select Apps>Control Panel>Hardware and Sound>Sound>Playback, set Intel(R) Display Audio to the default playback device.

(Note) The DVI-D port does not support D-Sub connection by adapter.

ⓖ DisplayPort

DisplayPort delivers high quality digital imaging and audio, supporting bi-directional audio transmission. DisplayPort can support both DPCP and HDCP content protection mechanisms. You can use this port to connect your DisplayPort-supported monitor. The maximum supported resolution is 4096x2160@24Hz or 3840x2160@60Hz, but the actual resolutions supported are dependent on the monitor being used.

After installing the DisplayPort device, make sure the default device for sound playback is the DisplayPort device. (The item name may differ from operating system. Refer to the HDMI settings information on the previous page for the configuration dialog box.)

Triple-Display Configurations for the Onboard Graphics:

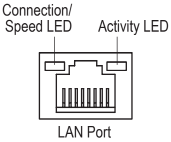
Triple-display configurations are supported after you install motherboard drivers in OS. Only dual-display configurations are supported during the BIOS Setup or POST process.

ⓗ USB 3.0/2.0 Port

The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓘ RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring

ⓙ Center/Subwoofer Speaker Out Jack (Orange)

Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration.

ⓚ Rear Speaker Out Jack (Black)

This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

ⓛ Side Speaker Out Jack (Gray)

Use this audio jack to connect side speakers in a 7.1-channel audio configuration.

ⓜ Line In Jack (Blue)

The line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

ⓝ Line Out Jack (Green)

The line out jack. This jack supports audio amplifying function. For better sound quality, it is recom-mended that you connect your headphone/speaker to this jack (actual effects may vary by the device being used). Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

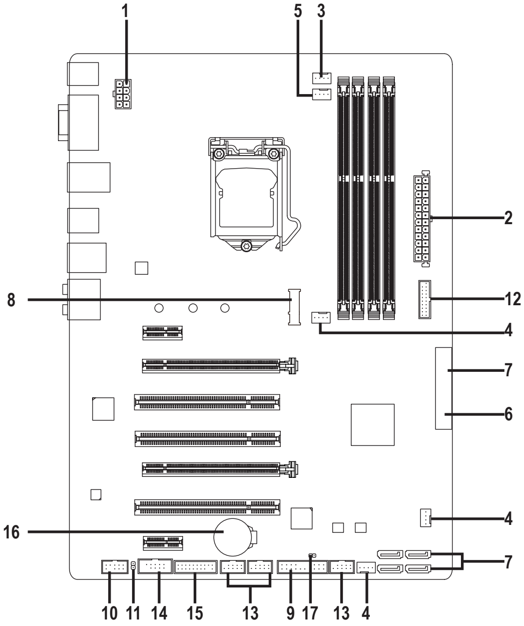
ⓞ Mic In Jack (Pink)

The Mic in jack. Microphones must be connected to this jack.

The audio jacks can be reconfigured to perform different functions via the audio software (supported functions for each jack may vary based on hardware specification). Only microphones still MUST be connected to the default Mic in jack.

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-7 Internal Connectors



1)	ATX_12V_2X4	10)	F_AUDIO
2)	ATX	11)	SPDIF_O
3)	CPU_FAN	12)	F_USB30
4)	SYS_FAN1/2/3	13)	F_USB1/F_USB2/F_USB3
5)	CPU_OPT	14)	COMA
6)	SATA_EXPRESS	15)	TPM
7)	SATA3 0/1/2/3/4/5	16)	BAT
8)	M.2	17)	CLR_CMOS
9)	F_PANEL		

Read the following guidelines before connecting external devices:

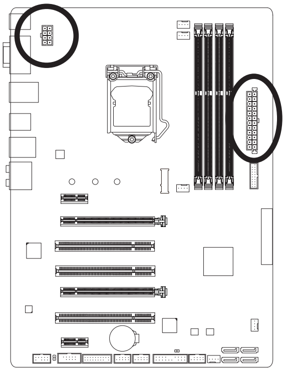
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

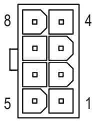
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

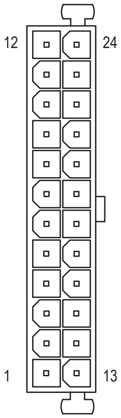




ATX_12V_2X4

ATX_12V_2X4:

Pin No.	Definition
1	GND (Only for 2x4-pin 12V)
2	GND (Only for 2x4-pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4-pin 12V)
6	+12V (Only for 2x4-pin 12V)
7	+12V
8	+12V



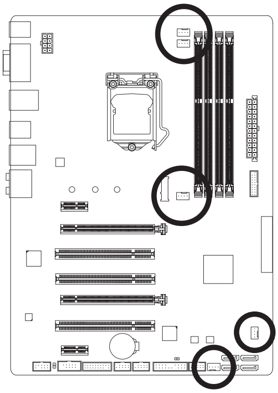
ATX

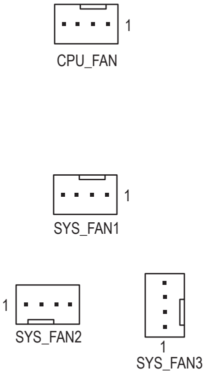
ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3/4) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3 (Fan Headers)

All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.





CPU_FAN:

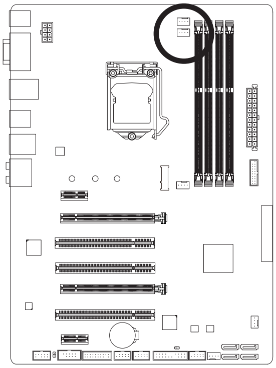
Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

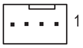
SYS_FAN1/2/3:

Pin No.	Definition
1	GND
2	+12V / Speed Control
3	Sense
4	VCC

5) CPU_OPT (Water Cooling CPU Fan Header)

The fan header is 4-pin and possesses a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design.



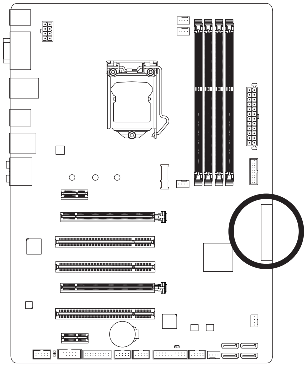


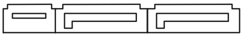
Pin No.	Definition
1	GND
2	+12V / Speed Control
3	Sense
4	VCC

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

6) SATA_EXPRESS (SATA Express Connector)

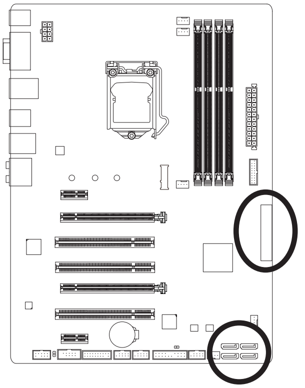
The SATA Express connector supports a single SATA Express device.

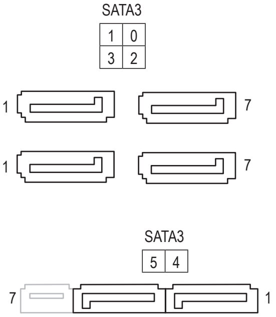




7) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel® Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 3, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



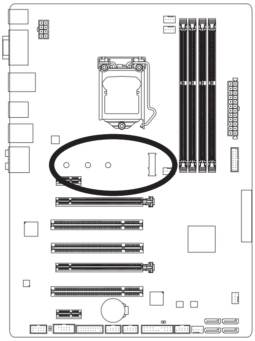


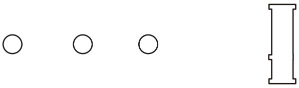
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- A RAID 10 configuration requires four hard drives.
- To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Peripherals\SATA Configuration," for more information.
- M.2, SATA Express, and SATA3 4/5 connectors can only be used one at a time. The SATA3 4/5 connectors will become unavailable when an M.2 SSD is installed.

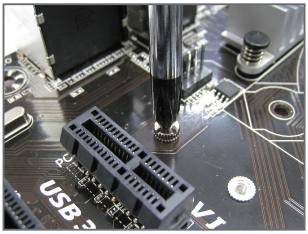
8) M.2 (M.2 Connector)

You can insert an M.2 SSD into this connector.



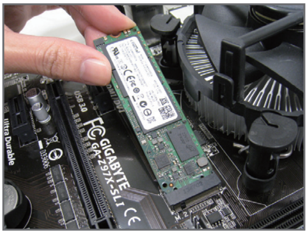


Follow the steps below to correctly install an M.2 SSD in the M.2 connector.



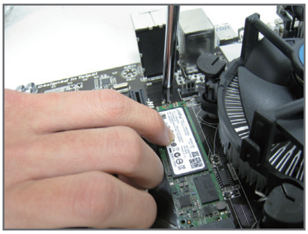
Step 1:

Use a screw driver to unfasten the screw and nut from the motherboard. Locate the proper mounting hole for the M.2 SSD to be installed and then screw the nut first.



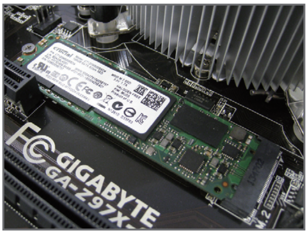
Step 2:

Slide the M.2 SSD into the connector at an oblique angle.



Step 3:

Press the M.2 SSD down and then secure it with the screw.



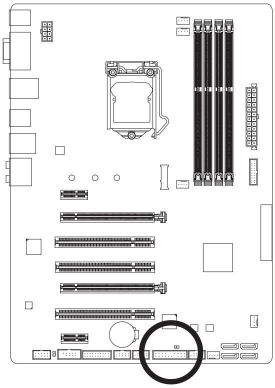
Step 4:

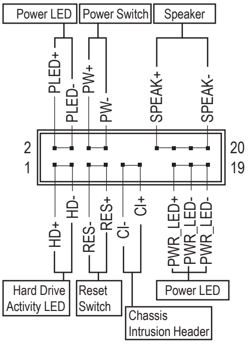
The installation is completed, as shown in the picture above.

- On the motherboard there are three length adjustment holes for the M.2 SSD. Select the proper hole for the M.2 SSD to be installed and refasten the screw and nut.
- M.2, SATA Express, and SATA3 4/5 connectors can only be used one at a time. The SATA3 4/5 connectors will become unavailable when an M.2 SSD is installed.

9) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.





- **PLED/PWR_LED** (Power LED, Yellow/Purple):

System Status	LED
S0	On
S3/S4/S5	Off

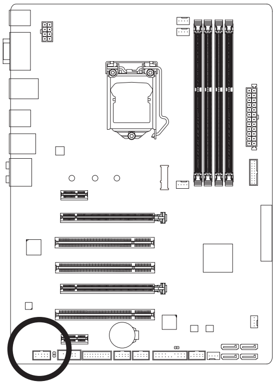
Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

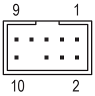
- **PW** (Power Switch, Red):
  Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- **SPEAK** (Speaker, Orange):
  Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.
- **HD** (Hard Drive Activity LED, Blue):
  Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.
- **RES** (Reset Switch, Green):
  Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
- **CI** (Chassis Intrusion Header, Gray):
  Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

10) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.





For HD Front Panel Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	GND
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	GND

For AC'97 Front Panel Audio:

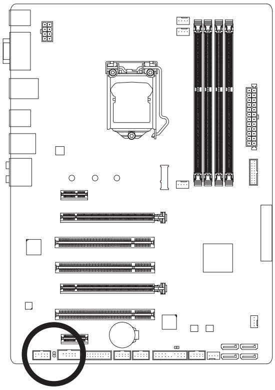
Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

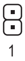
- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously. Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

11) SPDIF_O (S/PDIF Out Header)

This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.

For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.

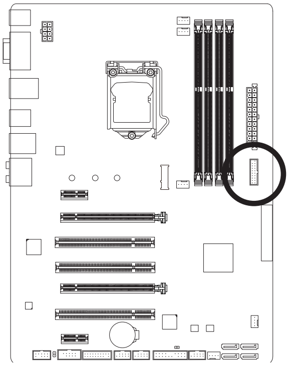


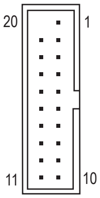


Pin No.	Definition
1	SPDIFO
2	GND

12) F_USB30 (USB 3.0/2.0 Header)

The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.

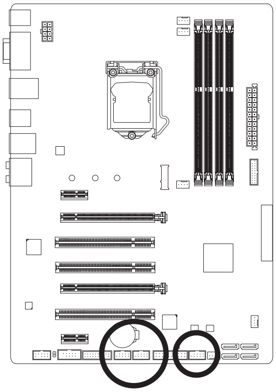


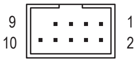


Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

13) F_USB1/F_USB2/F_USB3 (USB 2.0/1.1 Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



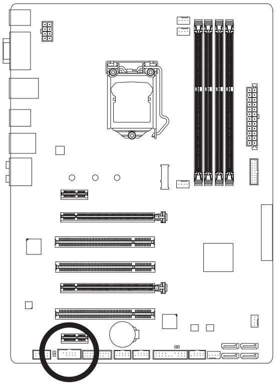


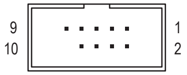
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

14) COMA (Serial Port Header)

The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

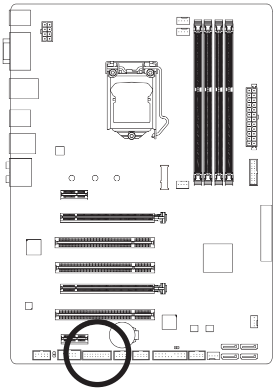


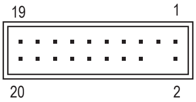


Pin No.	Definition
1	NDCD-
2	NSIN
3	NSOUT
4	NDTR-
5	GND
6	NDSR-
7	NRTS-
8	NCTS-
9	NRI-
10	No Pin

15) TPM (Trusted Platform Module Header)

You may connect a TPM (Trusted Platform Module) to this header.

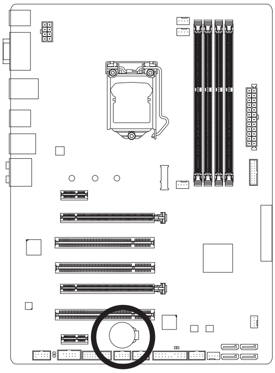


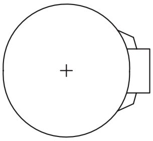


Pin No.	Definition	Pin No.	Definition
1	LCLK	11	LAD0
2	GND	12	GND
3	LFRAME	13	NC
4	No Pin	14	ID
5	LRESET	15	SB3V
6	NC	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	NC
9	VCC3	19	NC
10	LAD1	20	SUSCLK

16) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





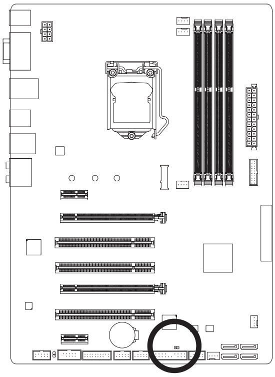
You may clear the CMOS values by removing the battery:

1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

17) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the BIOS configuration and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal

Short: Clear CMOS Values

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

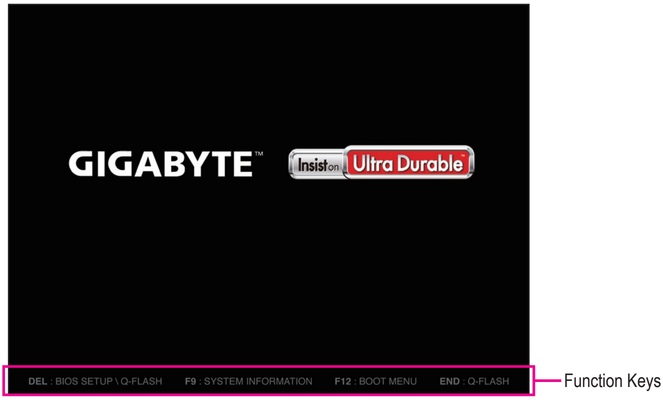
To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.

- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.


GIGABYTE™
Insist on Ultra Durable™
DEL : BIOS SETUP \ Q-FLASH
F9 : SYSTEM INFORMATION
F12 : BOOT MENU
END : Q-FLASH
Function Keys

Function Keys:

<DEL>: BIOS SETUP\Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F9>: SYSTEM INFORMATION

Press the <F9> key to display your system information.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.

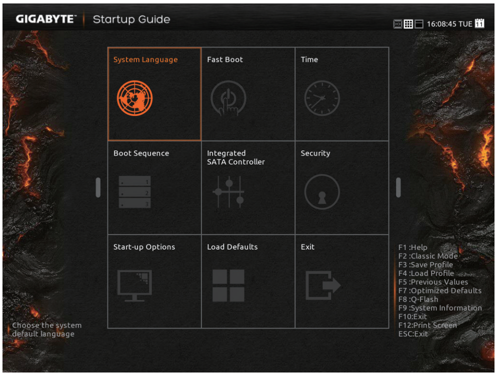
<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

2-2 The Main Menu

A. Startup Guide (Default)

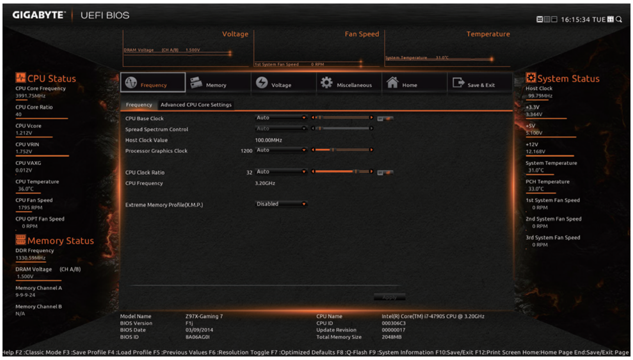
The Startup Guide screen simplifies conventional complicated BIOS setup menus and presents only the most frequently used options in the easy-to-use interface. It helps first-time users to perform basic system setups more quickly and easily.


GIGABYTE
Startup Guide
16:08:45 TUE
System Language
Fast Boot
Time
Boot Sequence
Integrated SATA Controller
Security
Start-up Options
Load Defaults
Exit
F1 :Help
F2 :Classic Mode
F3 :Save Profile
F4 :Load Profile
F5 :Previous Values
F7 :Optimized Defaults
F8 :Q-Flash
F9 :System Information
F10:Exit
F12:Print Screen
ESC:Exit

Choose the system default language

B. ST Mode (Smart Tweak Mode)

Differing from traditional UEFI interface, the ST Mode provides a fancy and user-friendly BIOS environment where users can easily point and click through various settings and make adjustments for optimum performance. In ST Mode, you can use your mouse to move through the option menus for quick configuration or press <F2> to switch to the traditional BIOS Setup screen.


GIGABYTE
UEFI BIOS
16:15:34 TUE
Voltage
Fan Speed
Temperature
DRAM Voltage (CH A/B) 1.500V
1st System Fan Speed 0 RPM
System Temperature 31.0°C
CPU Status
Memory Status
System Status
Frequency
Memory
Voltage
Miscellaneous
Home
Save & Exit
Frequency
Advanced CPU Core Settings
Apply
Help F2 :Classic Mode F3 :Save Profile F4 :Load Profile F5 :Previous Values F6 :Resolution Toggle F7 :Optimized Defaults F8 :Q-Flash F9 :System Information F10:Save/Exit F12:Print Screen Home:Home Page End:Save/Exit Page

CPU Core Frequency 3991.75MHz
CPU Core Ratio 40
CPU Vcore 1.212V
CPU VRIN 1.752V
CPU VAXG 0.012V
CPU Temperature 36.0°C
CPU Fan Speed 1795 RPM
CPU OPT Fan Speed 0 RPM

DDR Frequency 1330.59MHz
DRAM Voltage (CH A/B) 1.500V
Memory Channel A 9-9-9-24
Memory Channel B N/A

CPU Base Clock Auto
Spread Spectrum Control Auto
Host Clock Value 100.00MHz
Processor Graphics Clock 1200 Auto
CPU Clock Ratio 32 Auto
CPU Frequency 3.20GHz
Extreme Memory Profile(X.M.P.) Disabled

Host Clock 99.79MHz
+3.3V 3.344V
+5V 5.100V
+12V 12.168V
System Temperature 31.0°C
PCH Temperature 33.0°C
1st System Fan Speed 0 RPM
2nd System Fan Speed 0 RPM
3rd System Fan Speed 0 RPM

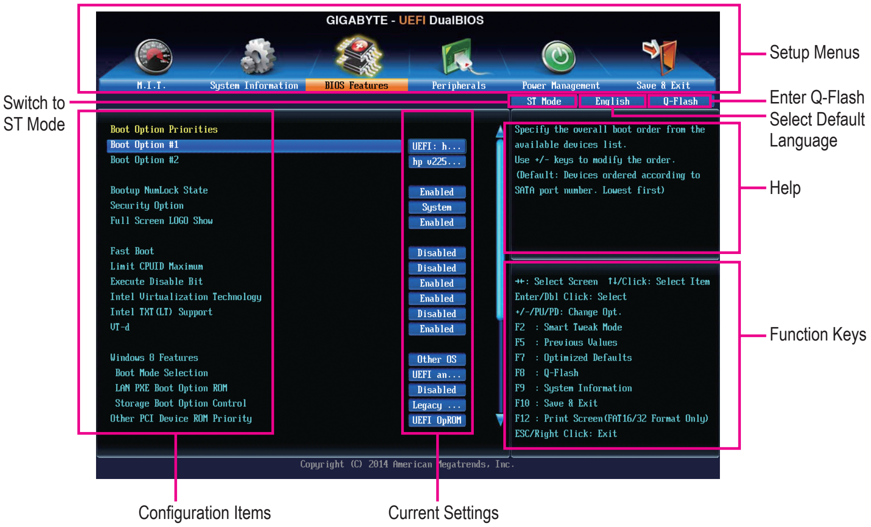
Model Name Z97X-Gaming 7
BIOS Version F1j
BIOS Date 03/09/2014
BIOS ID 8A06AG0I
CPU Name Intel(R) Core(TM) i7-4790S CPU @ 3.20GHz
CPU ID 000306C3
Update Revision 00000017
Total Memory Size 2048MB

- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

C. Classic Setup

Classic Setup is the conventional BIOS Setup interface where you can press the arrow keys on your keyboard to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

(Sample BIOS Version: E6)


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
ST Mode
English
Q-Flash
Setup Menus
Switch to ST Mode
Enter Q-Flash
Select Default Language
Help
Function Keys
Configuration Items
Current Settings

Boot Option Priorities

Boot Option #1	UEFI: h...
Boot Option #2	hp v225...
Bootup NumLock State	Enabled
Security Option	System
Full Screen LOGO Show	Enabled
Fast Boot	Disabled
Limit CPUID Maximum	Disabled
Execute Disable Bit	Enabled
Intel Virtualization Technology	Enabled
Intel TXT(LT) Support	Disabled
VT-d	Enabled
Windows 8 Features	Other OS
Boot Mode Selection	UEFI an...
LAN PXE Boot Option ROM	Disabled
Storage Boot Option Control	Legacy ...
Other PCI Device ROM Priority	UEFI OpROM

Specify the overall boot order from the available devices list.
Use +/- keys to modify the order.
(Default: Devices ordered according to SATA port number. Lowest first)

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Smart Tweak Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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Classic Setup Function Keys

<←><→>	Move the selection bar to select a setup menu
<↑><↓>	Move the selection bar to select an configuration item on a menu
<Enter>	Execute command or enter a menu
<+>/<Page Up>	Increase the numeric value or make changes
<->/<Page Down>	Decrease the numeric value or make changes
<F2>	Switch to ST Mode or Startup Guide screen.
<F5>	Restore the previous BIOS settings for the current submenus
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F9>	Display system information
<F10>	Save all the changes and exit the BIOS Setup program
<F12>	Capture the current screen as an image and save it to your USB drive
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu

BIOS Setup Menus

- **M.I.T.**

  Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc. Or check the system/CPU temperatures, voltages, and fan speeds.

- **System Information**

  Use this menu to configure the default language used by the BIOS and system time and date.

- **BIOS Features**

  Use this menu to configure the device boot order and advanced features available on the CPU.

- **Peripherals**

  Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc.

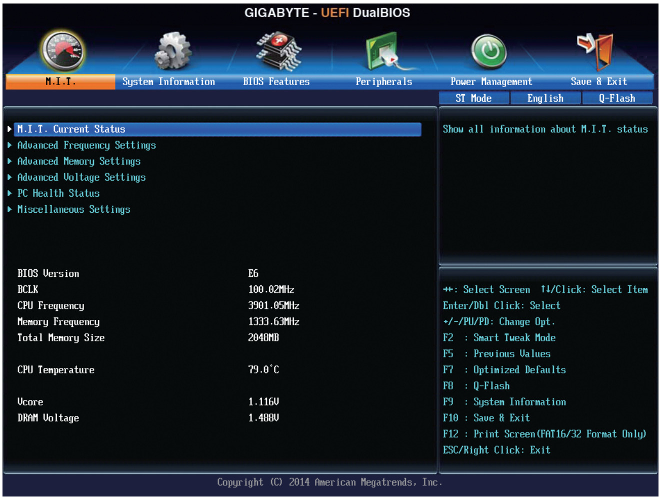
- **Power Management**

  Use this menu to configure all the power-saving functions.

- **Save & Exit**

  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations.

2-3 M.I.T.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
ST Mode
English
Q-Flash

▸ M.I.T. Current Status
▸ Advanced Frequency Settings
▸ Advanced Memory Settings
▸ Advanced Voltage Settings
▸ PC Health Status
▸ Miscellaneous Settings

BIOS Version	E6
BCLK	100.02MHz
CPU Frequency	3901.05MHz
Memory Frequency	1333.63MHz
Total Memory Size	2048MB
CPU Temperature	79.0°C
Vcore	1.116V
DRAM Voltage	1.488V

Show all information about M.I.T. status

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Smart Tweak Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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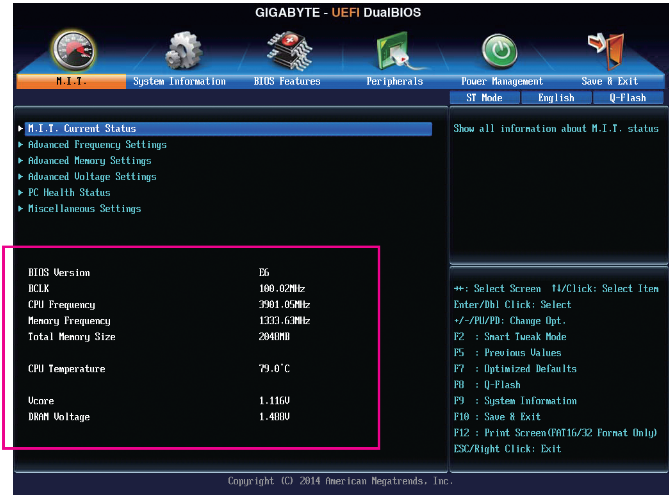
Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
ST Mode
English
Q-Flash

▸ M.I.T. Current Status
▸ Advanced Frequency Settings
▸ Advanced Memory Settings
▸ Advanced Voltage Settings
▸ PC Health Status
▸ Miscellaneous Settings

BIOS Version E6
BCLK 100.02MHz
CPU Frequency 3901.05MHz
Memory Frequency 1333.63MHz
Total Memory Size 2048MB
CPU Temperature 79.0°C
Vcore 1.116V
DRAM Voltage 1.488V

Show all information about M.I.T. status

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Smart Tweak Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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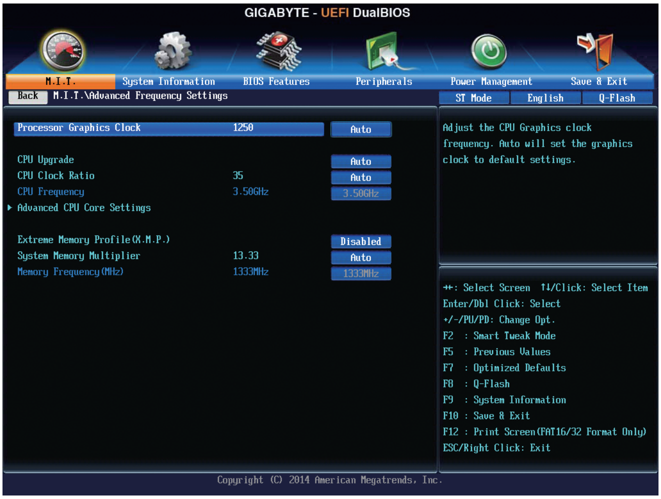
This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.

M.I.T. Current Status

This screen provides information on CPU/memory frequencies/parameters.

Advanced Frequency Settings



```
M.I.T.\Advanced Frequency Settings

Processor Graphics Clock            1250        Auto

CPU Upgrade                                     Auto
CPU Clock Ratio                     35          Auto
CPU Frequency                       3.50GHz     3.50GHz
▸ Advanced CPU Core Settings

Extreme Memory Profile(X.M.P.)                  Disabled
System Memory Multiplier            13.33       Auto
Memory Frequency(MHz)               1333MHz     1333MHz

Adjust the CPU Graphics clock
frequency. Auto will set the graphics
clock to default settings.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

Processor Graphics Clock

Allows you to set the onboard graphics clock. The adjustable range is from 400 MHz to 4000 MHz. (Default: Auto)

CPU Upgrade (Note)

Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto)

CPU Clock Ratio

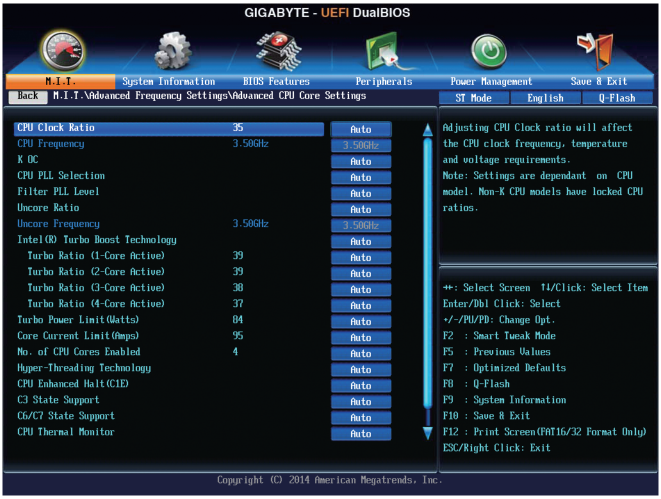
Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.

CPU Frequency

Displays the current operating CPU frequency.

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

Advanced CPU Core Settings



```
M.I.T.\Advanced Frequency Settings\Advanced CPU Core Settings

CPU Clock Ratio                      35        Auto
CPU Frequency                        3.50GHz   3.50GHz
K OC                                           Auto
CPU PLL Selection                              Auto
Filter PLL Level                               Auto
Uncore Ratio                                   Auto
Uncore Frequency                     3.50GHz   3.50GHz
Intel(R) Turbo Boost Technology                Auto
  Turbo Ratio (1-Core Active)        39        Auto
  Turbo Ratio (2-Core Active)        39        Auto
  Turbo Ratio (3-Core Active)        38        Auto
  Turbo Ratio (4-Core Active)        37        Auto
Turbo Power Limit(Watts)             84        Auto
Core Current Limit(Amps)             95        Auto
No. of CPU Cores Enabled             4         Auto
Hyper-Threading Technology                     Auto
CPU Enhanced Halt(C1E)                         Auto
C3 State Support                               Auto
C6/C7 State Support                            Auto
CPU Thermal Monitor                            Auto

Adjusting CPU Clock ratio will affect
the CPU clock frequency, temperature
and voltage requirements.
Note: Settings are dependant  on  CPU
model. Non-K CPU models have locked CPU
ratios.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

CPU Clock Ratio, CPU Frequency

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

K OC (Note)

Allows for increased performance by using certain CPUs. (Default: Auto)

CPU PLL Selection

Allows you to set the CPU PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Filter PLL Level

Allows you to set the Filter PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Uncore Ratio

Allows you to set the CPU Uncore ratio. The adjustable range is dependent on the CPU being used.

Uncore Frequency

Displays the current CPU Uncore frequency.

Intel(R) Turbo Boost Technology (Note)

Allows you to determine whether to enable the Intel CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Turbo Ratio (1-Core Active~4-Core Active) (Note)

Allows you to set the CPU Turbo ratios for different number of active cores. **Auto** sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto)

Turbo Power Limit (Watts)

Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

Core Current Limit (Amps)

Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

No. of CPU Cores Enabled (Note 1)

Allows you to select the number of CPU cores to enable in an Intel® multi-core CPU (the number of CPU cores may vary by CPU). Auto lets the BIOS automatically configure this setting. (Default: Auto)

Hyper-Threading Technology (Note 1)

Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

CPU Enhanced Halt (C1E) (Note 1)

Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

C3 State Support (Note 1)

Allows you to determine whether to let the CPU enter C3 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3 state is a more enhanced power-saving state than C1. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

C6/C7 State Support (Note 1)

Allows you to determine whether to let the CPU enter C6/C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C6/C7 state is a more enhanced power-saving state than C3. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

CPU Thermal Monitor (Note 1)

Enables or disables Intel® Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

CPU EIST Function (Note 1)

Enables or disables Enhanced Intel® Speed Step Technology (EIST). Depending on CPU loading, Intel EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Extreme Memory Profile (X.M.P.) (Note 2)

Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

⏩ Disabled	Disables this function. (Default)
⏩ Profile1	Uses Profile 1 settings.
⏩ Profile2 (Note 2)	Uses Profile 2 settings.

(Note 1) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

(Note 2) This item is present only when you install a CPU and a memory module that support this feature.

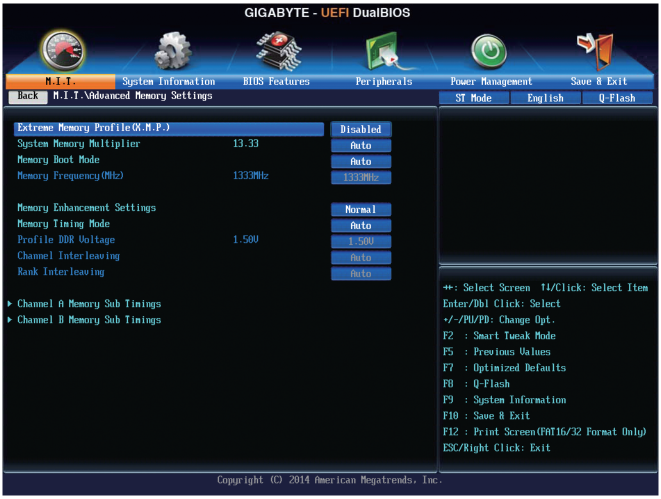
☞ System Memory Multiplier

Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)

☞ Memory Frequency (MHz)

The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **System Memory Multiplier** settings.

▸ Advanced Memory Settings



```
Extreme Memory Profile(X.M.P.)                        Disabled
System Memory Multiplier              13.33           Auto
Memory Boot Mode                                      Auto
Memory Frequency(MHz)                 1333MHz         1333MHz

Memory Enhancement Settings                           Normal
Memory Timing Mode                                    Auto
Profile DDR Voltage                   1.50V           1.50V
Channel Interleaving                                  Auto
Rank Interleaving                                     Auto

▸ Channel A Memory Sub Timings
▸ Channel B Memory Sub Timings
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Extreme Memory Profile (X.M.P.) (Note), System Memory Multiplier, Memory Frequency(MHz)

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ Memory Boot Mode

Provides memory detection and training methods.

▸▸ Auto	Lets the BIOS automatically configure this setting. (Default)
▸▸ Enable Fast Boot	Skip memory detection and training in some specific criteria for faster memory boot.
▸▸ Disable Fast Boot	Detect and train memory at every single boot.

☞ Memory Enhancement Settings

Provides three different memory performance enhancement settings: Normal (basic performance), Enhanced Stability, and Enhanced Performance. (Default: Normal)

☞ Memory Timing Mode

Manual and **Advanced Manual** allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Manual, Advanced Manual.

☞ Profile DDR Voltage

When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, the value is displayed according to your memory specification. When Extreme Memory Profile (X.M.P.) is set to **Profile1** or **Profile2**, the value is displayed according to the SPD data on the XMP memory.

(Note) This item is present only when you install a CPU and a memory module that support this feature.

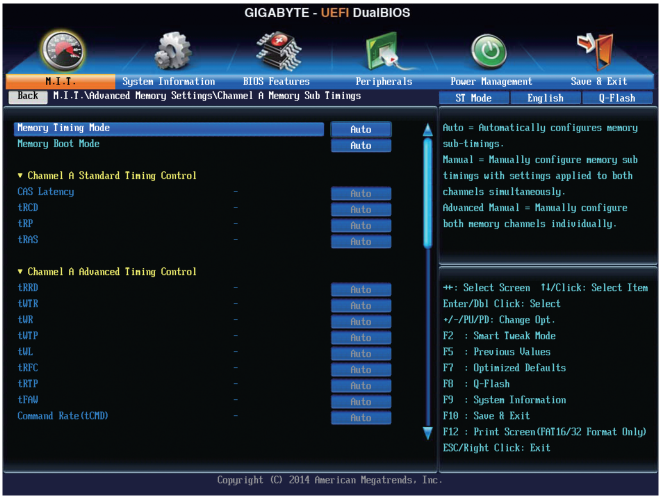
☞ Channel Interleaving

Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Rank Interleaving

Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

▶ Channel A/B Memory Sub Timings



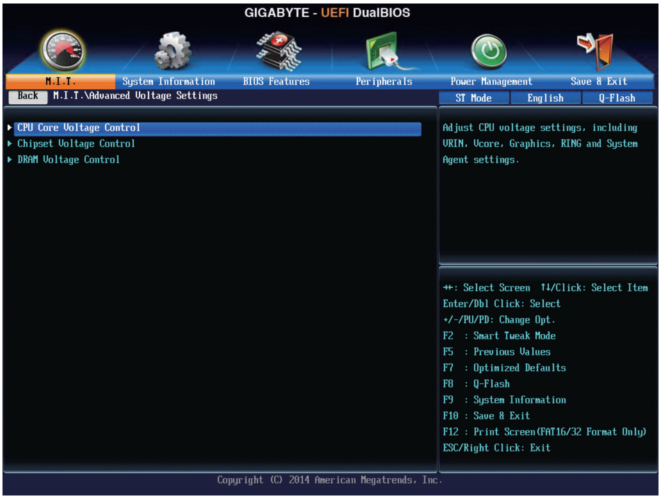
```
M.I.T.\Advanced Memory Settings\Channel A Memory Sub Timings

Memory Timing Mode                          Auto
Memory Boot Mode                            Auto

▼ Channel A Standard Timing Control
CAS Latency                    -            Auto
tRCD                           -            Auto
tRP                            -            Auto
tRAS                           -            Auto

▼ Channel A Advanced Timing Control
tRRD                           -            Auto
tWTR                           -            Auto
tWR                            -            Auto
tWTP                           -            Auto
tWL                            -            Auto
tRFC                           -            Auto
tRTP                           -            Auto
tFAW                           -            Auto
Command Rate(tCMD)             -            Auto
```

```
Auto = Automatically configures memory
sub-timings.
Manual = Manually configure memory sub
timings with settings applied to both
channels simultaneously.
Advanced Manual = Manually configure
both memory channels individually.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

This sub-menu provides memory timing settings for each channel of memory. This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **Memory Timing Mode** is set to **Manual** or **Advanced Manual**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.

Advanced Voltage Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\Advanced Voltage Settings
ST Mode
English
Q-Flash
CPU Core Voltage Control
Chipset Voltage Control
DRAM Voltage Control

Adjust CPU voltage settings, including VRIN, Vcore, Graphics, RING and System Agent settings.

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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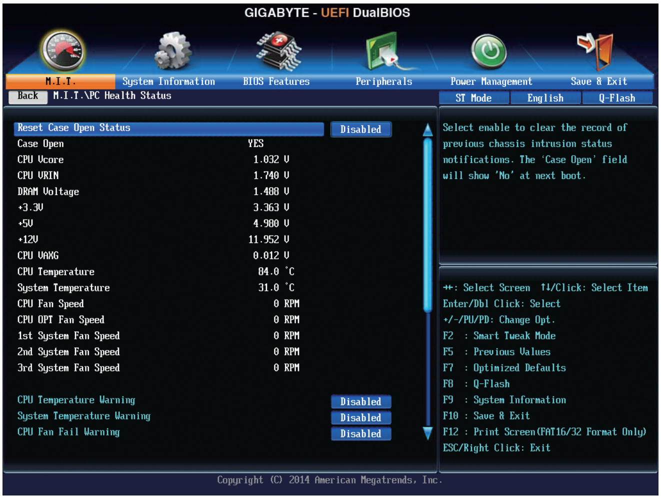
This sub-menu allows you to set CPU, chipset and memory voltages.

PC Health Status


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\PC Health Status
ST Mode
English
Q-Flash

```
Reset Case Open Status                          Disabled
Case Open                          YES
CPU Vcore                          1.032 V
CPU VRIN                           1.740 V
DRAM Voltage                       1.488 V
+3.3V                              3.363 V
+5V                                4.980 V
+12V                              11.952 V
CPU VAXG                           0.012 V
CPU Temperature                    84.0 °C
System Temperature                 31.0 °C
CPU Fan Speed                          0 RPM
CPU OPT Fan Speed                      0 RPM
1st System Fan Speed                   0 RPM
2nd System Fan Speed                   0 RPM
3rd System Fan Speed                   0 RPM

CPU Temperature Warning                         Disabled
System Temperature Warning                      Disabled
CPU Fan Fail Warning                            Disabled

Select enable to clear the record of
previous chassis intrusion status
notifications. The 'Case Open' field
will show 'No' at next boot.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

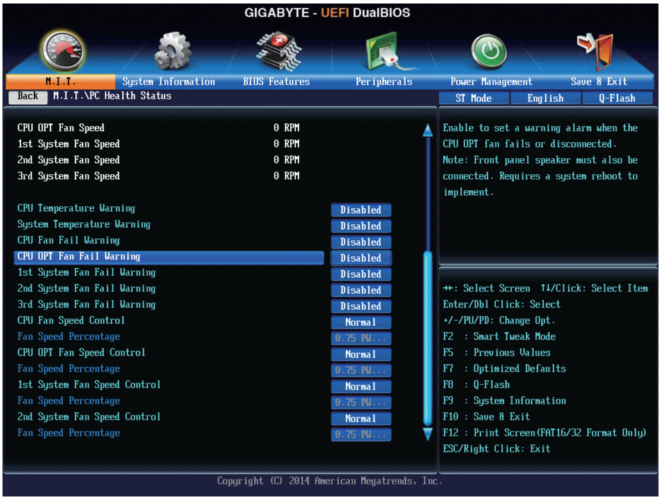
GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\PC Health Status
ST Mode
English
Q-Flash

```
CPU OPT Fan Speed                      0 RPM
1st System Fan Speed                   0 RPM
2nd System Fan Speed                   0 RPM
3rd System Fan Speed                   0 RPM

CPU Temperature Warning                         Disabled
System Temperature Warning                      Disabled
CPU Fan Fail Warning                            Disabled
CPU OPT Fan Fail Warning                        Disabled
1st System Fan Fail Warning                     Disabled
2nd System Fan Fail Warning                     Disabled
3rd System Fan Fail Warning                     Disabled
CPU Fan Speed Control                           Normal
Fan Speed Percentage                            0.75 PW...
CPU OPT Fan Speed Control                       Normal
Fan Speed Percentage                            0.75 PW...
1st System Fan Speed Control                    Normal
Fan Speed Percentage                            0.75 PW...
2nd System Fan Speed Control                    Normal
Fan Speed Percentage                            0.75 PW...

Enable to set a warning alarm when the
CPU OPT fan fails or disconnected.
Note: Front panel speaker must also be
connected. Requires a system reboot to
implement.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

Reset Case Open Status

▸▸ Disabled	Keeps or clears the record of previous chassis intrusion status. (Default)
▸▸ Enabled	Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.

Case Open

Displays the detection status of the chassis intrusion detection device attached to the motherboard **CI header**. If the system chassis cover is removed, this field will show **"Yes"**, otherwise it will show **"No"**. To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

☞ CPU Vcore/CPU VRIN/DRAM Voltage/+3.3V/+5V/+12V/CPU VAXG

Displays the current system voltages.

☞ CPU/System Temperature

Displays current CPU/system temperature.

☞ CPU/CPU OPT/System Fan Speed

Displays current CPU/CPU_OPT/system fan (SYS_FAN1~3) speeds.

☞ CPU/System Temperature Warning

Sets the warning threshold for CPU/system temperature. When temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.

☞ CPU/CPU OPT/System Fan Fail Warning

Allows the system to emit warning sound if the fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled)

☞ CPU Fan Speed Control (CPU_FAN Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

» Normal	Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
» Silent	Allows the fan to run at slow speeds.
» Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
» Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ CPU OPT Fan Speed Control (CPU_OPT Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

» Normal	Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
» Silent	Allows the fan to run at slow speeds.
» Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
» Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **CPU OPT Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ 1st System Fan Speed Control (SYS_FAN1 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

» Normal	Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
» Silent	Allows the fan to run at slow speeds.
» Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
» Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **1st System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ 2nd System Fan Speed Control (SYS_FAN2 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

▸▸ Normal	Allows the fan to run at different speeds according to the system temperature. (Default)
▸▸ Silent	Allows the fan to run at slow speeds.
▸▸ Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
▸▸ Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **2nd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ 3rd System Fan Speed Control (SYS_FAN3 Connector)

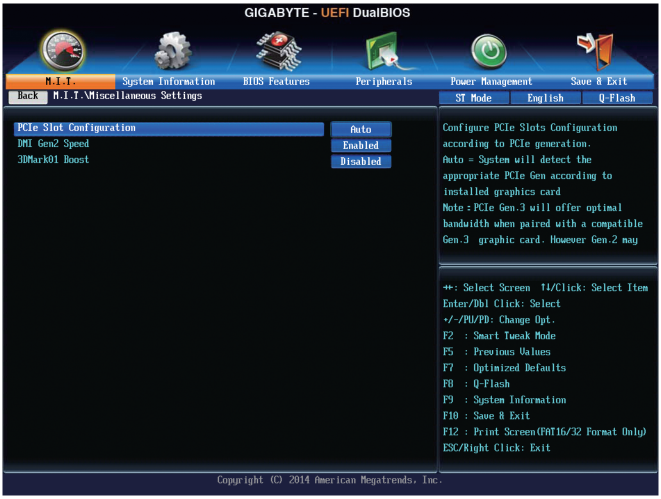
Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

▸▸ Normal	Allows the fan to run at different speeds according to the system temperature. (Default)
▸▸ Silent	Allows the fan to run at slow speeds.
▸▸ Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
▸▸ Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **3rd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

Miscellaneous Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\Miscellaneous Settings
ST Mode
English
Q-Flash

PCIe Slot Configuration Auto
DMI Gen2 Speed Enabled
3DMark01 Boost Disabled

Configure PCIe Slots Configuration according to PCIe generation.
Auto = System will detect the appropriate PCIe Gen according to installed graphics card
Note : PCIe Gen.3 will offer optimal bandwidth when paired with a compatible Gen.3 graphic card. However Gen.2 may

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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PCIe Slot Configuration

Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. Auto lets the BIOS automatically configure this setting. (Default: Auto)

DMI Gen2 Speed

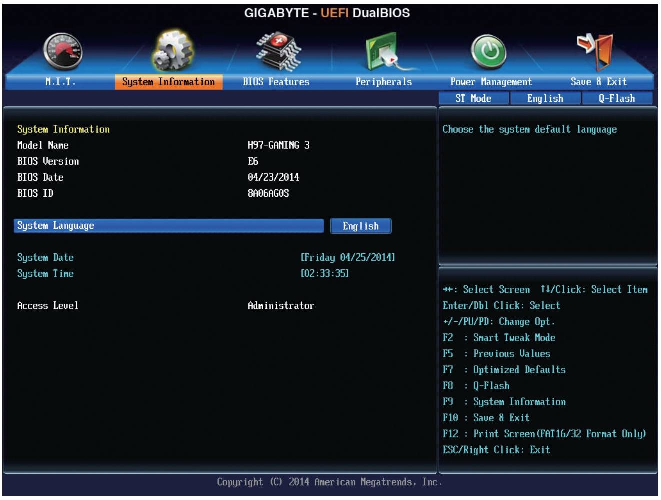
Allows you to configure the DMI link speed.

▸▸ Auto	Lets the BIOS automatically configure this setting.
▸▸ Enabled	Sets the DMI link speed to Gen 2. (Default)
▸▸ Disabled	Sets the DMI link speed to Gen 1.

3DMark01 Boost

Allows you to determine whether to enhance some legacy benchmark performance. (Default: Disabled)

2-4 System Information



```
System Information
Model Name                    H97-GAMING 3
BIOS Version                  E6
BIOS Date                     04/23/2014
BIOS ID                       8A06AG0S

System Language               English

System Date                   [Friday 04/25/2014]
System Time                   [02:33:35]

Access Level                  Administrator

Choose the system default language

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ System Language

Selects the default language used by the BIOS.

☞ System Date

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

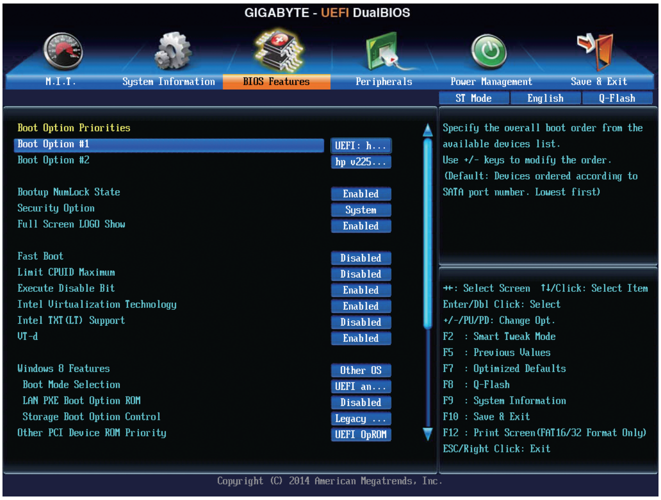
☞ System Time

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:0:0. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ Access Level

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as **Administrator**.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

2-5 BIOS Features



```
Boot Option Priorities
Boot Option #1                              UEFI: h...
Boot Option #2                              hp v225...

Bootup NumLock State                        Enabled
Security Option                             System
Full Screen LOGO Show                       Enabled

Fast Boot                                   Disabled
Limit CPUID Maximum                         Disabled
Execute Disable Bit                         Enabled
Intel Virtualization Technology             Enabled
Intel TXT(LT) Support                       Disabled
VT-d                                        Enabled

Windows 8 Features                          Other OS
 Boot Mode Selection                        UEFI an...
 LAN PXE Boot Option ROM                    Disabled
 Storage Boot Option Control                Legacy ...
Other PCI Device ROM Priority               UEFI OpROM
```

```
Specify the overall boot order from the
available devices list.
Use +/- keys to modify the order.
(Default: Devices ordered according to
SATA port number. Lowest first)
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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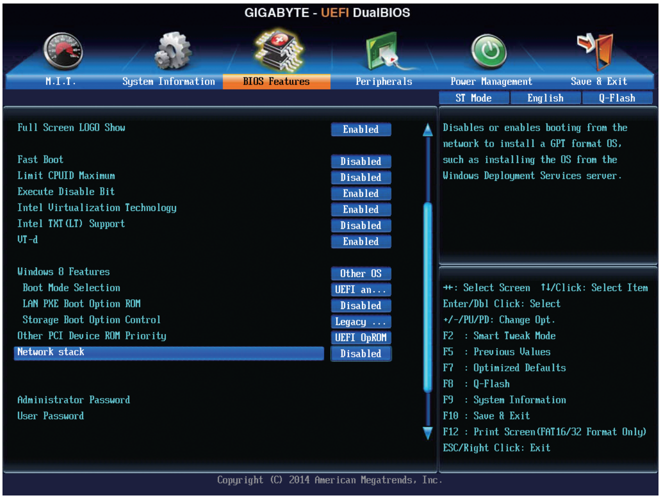

```
Full Screen LOGO Show                       Enabled

Fast Boot                                   Disabled
Limit CPUID Maximum                         Disabled
Execute Disable Bit                         Enabled
Intel Virtualization Technology             Enabled
Intel TXT(LT) Support                       Disabled
VT-d                                        Enabled

Windows 8 Features                          Other OS
 Boot Mode Selection                        UEFI an...
 LAN PXE Boot Option ROM                    Disabled
 Storage Boot Option Control                Legacy ...
Other PCI Device ROM Priority               UEFI OpROM
Network stack                               Disabled


Administrator Password
User Password
```

```
Disables or enables booting from the
network to install a GPT format OS,
such as installing the OS from the
Windows Deployment Services server.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Boot Option Priorities

Specifies the overall boot order from the available devices. Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

☞ Bootup NumLock State

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Enabled)

Security Option

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Administrator Password/User Password** item.

Setup	A password is only required for entering the BIOS Setup program.
System	A password is required for booting the system and for entering the BIOS Setup program. (Default)

Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

Fast Boot

Enables or disables Fast Boot to shorten the OS boot process. **Ultra Fast** provides the fastest bootup speed. (Default: Disabled)

VGA Support

Allows you to select which type of operating system to boot.

Auto	Enables legacy option ROM only.
EFI Driver	Enables EFI option ROM. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

USB Support

Disabled	All USB devices are disabled before the OS boot process completes.
Full Initial	All USB devices are functional in the operating system and during the POST.
Partial Initial	Part of the USB devices are disabled before the OS boot process completes. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.

PS2 Devices Support

Disabled	All PS/2 devices are disabled before the OS boot process completes.
Enabled	All PS/2 devices are functional in the operating system and during the POST. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.

NetWork Stack Driver Support

Disabled	Disables booting from the network. (Default)
Enabled	Enables booting from the network.

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

Next Boot After AC Power Loss

Normal Boot	Enables normal bootup upon the return of the AC power. (Default)
Fast Boot	Keeps the Fast Boot settings upon the return of the AC power.

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

Limit CPUID Maximum (Note)

Allows you to determine whether to limit CPUID maximum value. Set this item to **Disabled** for Windows XP operating system; set this item to **Enabled** for legacy operating system such as Windows NT4.0. (Default: Disabled)

Execute Disable Bit (Note)

Enables or disables Intel® Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ Intel Virtualization Technology (Note)

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Enabled)

☞ Intel TXT(LT) Support (Note)

Enables or disables **Intel® Trusted Execution Technology** (Intel® TXT). Intel® Trusted Execution Technology provides a hardware-based security foundation. (Default: Disabled)

☞ VT-d (Note)

Enables or disables Intel® Virtualization Technology for Directed I/O. (Default: Enabled)

☞ Windows 8 Features

Allows you to select the operating system to be installed. (Default: Other OS)

☞ CSM Support

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

⏩ Always	Enables UEFI CSM. (Default)
⏩ Never	Disables UEFI CSM and supports UEFI BIOS boot process only.

This item is configurable only when **Windows 8 Features** is set to **Windows 8**.

☞ Boot Mode Selection

Allows you to select which type of operating system to boot.

⏩ UEFI and Legacy	Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
⏩ Legacy Only	Allows booting from operating systems that only support legacy Option ROM.
⏩ UEFI Only	Allows booting from operating systems that only support UEFI Option ROM.

This item is configurable only when **CSM Support** is set to **Always**.

☞ LAN PXE Boot Option ROM

Allows you to select whether to enable the legacy option ROM for the LAN controller. (Default: Disabled) This item is configurable only when **CSM Support** is set to **Always**.

☞ Storage Boot Option Control

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

⏩ Disabled	Disables option ROM.
⏩ UEFI Only	Enables UEFI option ROM only.
⏩ Legacy Only	Enables legacy option ROM only. (Default)
⏩ Legacy First	Enables legacy option ROM first.
⏩ UEFI First	Enables UEFI option ROM first.

This item is configurable only when **CSM Support** is set to **Always**.

☞ Other PCI Device ROM Priority

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

⏩ Legacy OpROM	Enables legacy option ROM only.
⏩ UEFI OpROM	Enables UEFI option ROM only. (Default)

This item is configurable only when **CSM Support** is set to **Always**.

☞ Network stack

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ **Ipv4 PXE Support**

Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Ipv6 PXE Support**

Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Administrator Password**

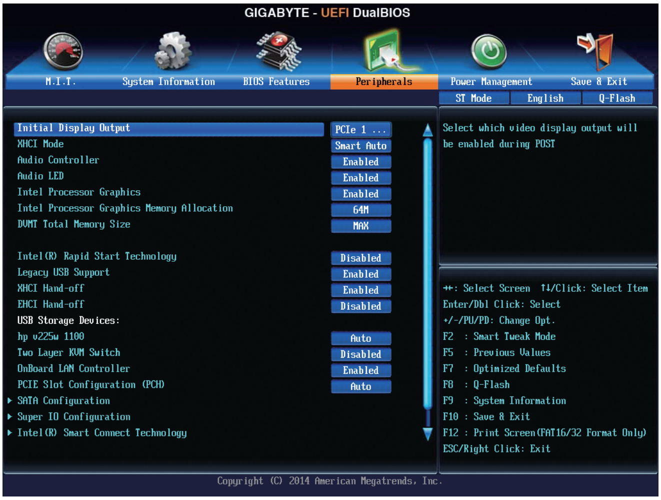
Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

2-6 Peripherals



```
Initial Display Output                          PCIe 1 ...
XHCI Mode                                       Smart Auto
Audio Controller                                Enabled
Audio LED                                       Enabled
Intel Processor Graphics                        Enabled
Intel Processor Graphics Memory Allocation      64M
DVMT Total Memory Size                          MAX

Intel(R) Rapid Start Technology                 Disabled
Legacy USB Support                              Enabled
XHCI Hand-off                                   Enabled
EHCI Hand-off                                   Disabled
USB Storage Devices:
hp v225w 1100                                   Auto
Two Layer KVM Switch                            Disabled
OnBoard LAN Controller                          Enabled
PCIE Slot Configuration (PCH)                   Auto
▸ SATA Configuration
▸ Super IO Configuration
▸ Intel(R) Smart Connect Technology
```

```
Select which video display output will
be enabled during POST
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Initial Display Output

Specifies the first initiation of the monitor display from the installed PCI graphics card, PCI Express graphics card or the onboard graphics.

⏩ IGFX	Sets the onboard graphics as the first display.
⏩ PCIe 1 Slot	Sets the graphics card on the PCIEX16 slot as the first display. (Default)
⏩ PCIe 2 Slot	Sets the graphics card on the PCIEX4 slot as the first display.
⏩ PCI	Sets the graphics card on the PCI slot as the first display.

☞ XHCI Mode

Allows you to determine the operating mode for the xHCI controller in OS.

⏩ Smart Auto	This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support. (Default)
⏩ Auto	BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support.
⏩ Enabled	All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.
⏩ Disabled	The USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned off. All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability.

☞ **Audio Controller**

Enables or disables the onboard audio function. (Default: Enabled)

If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

☞ **Audio LED**

Enables or disables the onboard audio LED. (Default: Enabled)

☞ **Intel Processor Graphics**

Enables or disables the onboard graphics function. (Default: Enabled)

☞ **Intel Processor Graphics Memory Allocation**

Allows you to set the onboard graphics memory size. Options are: 32M~1024M. (Default: 64M)

☞ **DVMT Total Memory Size**

Allows you to allocate the DVMT memory size of the onboard graphics. Options are: 128M, 256M, MAX. (Default: MAX)

☞ **Intel(R) Rapid Start Technology**

Enables or disables Intel® Rapid Start Technology. (Default: Disabled)

☞ **Legacy USB Support**

Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)

☞ **XHCI Hand-off**

Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)

☞ **EHCI Hand-off**

Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)

☞ **USB Storage Devices**

Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

☞ **Two Layer KVM Switch**

Set to **Enabled** to ensure proper device functionality when chaining two KVM switches. (Default: Disabled)

☞ **OnBoard LAN Controller**

Enables or disables the onboard LAN function. (Default: Enabled)

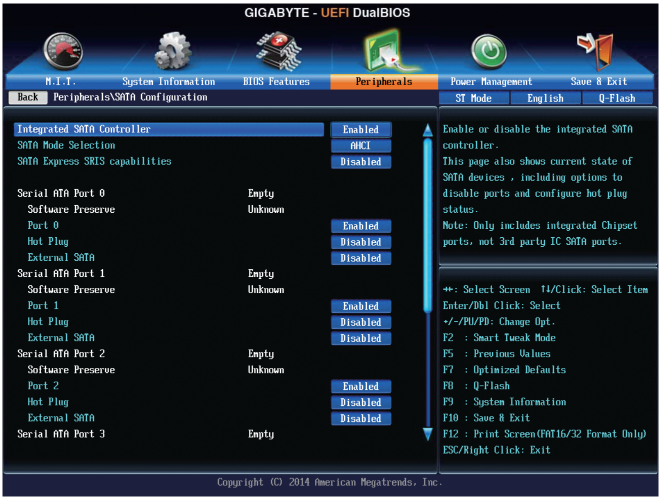
If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

☞ **PCIE Slot Configuration (PCH)**

Specifies the operating bandwidth for the PCIEX4 slot.

⏩ Auto	Lets the BIOS automatically configure this setting depending on the expansion card being installed. (Default)
⏩ x1	PCIEX4 operates at x1 mode.
⏩ x4	PCIEX4 operates at x4 mode.

SATA Configuration



Integrated SATA Controller Enabled
SATA Mode Selection AHCI
SATA Express SRIS capabilities Disabled

Serial ATA Port 0 Empty
Software Preserve Unknown
Port 0 Enabled
Hot Plug Disabled
External SATA Disabled
Serial ATA Port 1 Empty
Software Preserve Unknown
Port 1 Enabled
Hot Plug Disabled
External SATA Disabled
Serial ATA Port 2 Empty
Software Preserve Unknown
Port 2 Enabled
Hot Plug Disabled
External SATA Disabled
Serial ATA Port 3 Empty

Enable or disable the integrated SATA controller.
This page also shows current state of SATA devices , including options to disable ports and configure hot plug status.
Note: Only includes integrated Chipset ports, not 3rd party IC SATA ports.

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Smart Tweak Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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Integrated SATA Controller

Enables or disables the integrated SATA controllers. (Default: Enabled)

SATA Mode Selection

Enables or disables RAID for the SATA controllers integrated in the Chipset or configures the SATA controllers to AHCI mode.

➤➤ IDE	Configures the SATA controller to IDE mode.
➤➤ AHCI	Configures the SATA controller to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
➤➤ RAID	Enables RAID for the SATA controller.

M.2 PCIE SSD RAID Mode

Enables or disables Intel® Rapid Storage Technology for the M.2 PCIe SSD. (Default: Enabled)
This item is configurable only when **SATA Mode Selection** is set to **RAID**.

SATA Express SRIS capabilities

Enables or disables SATA Express SRIS (Separate Reference Clocks with Independent SSC) mode. (Default: Disabled)

Serial ATA Port 0/1/2/3/4/5

Port 0/1/2/3/4/5

Enables or disables each SATA port. (Default: Enabled)

Hot plug

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

External SATA

Enables or disables support for external SATA devices. (Default: Disabled)

Super IO Configuration

This section provides information on the super I/O chip and allows you to configure the serial port.

☞ **Serial Port A**

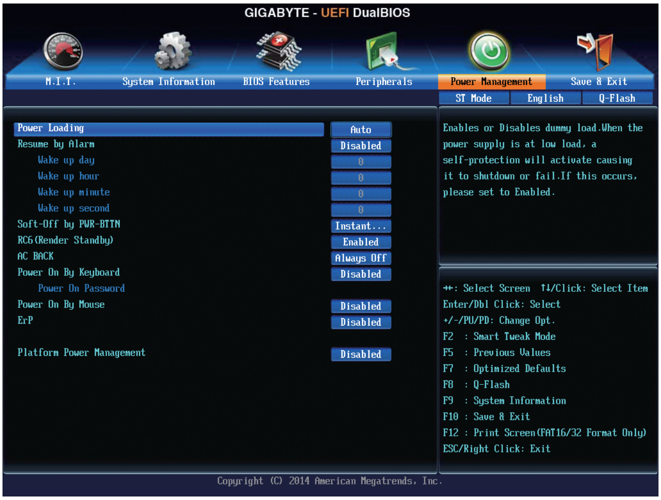
Enables or disables the onboard serial port. (Default: Enabled)

Intel(R) Smart Connect Technology

☞ **ISCT Support**

Enables or disables Intel® Smart Connect Technology. (Default: Disabled)

2-7 Power Management



```
Power Loading                          Auto
Resume by Alarm                        Disabled
    Wake up day                        0
    Wake up hour                       0
    Wake up minute                     0
    Wake up second                     0
Soft-Off by PWR-BTTN                   Instant...
RC6(Render Standby)                    Enabled
AC BACK                                Always Off
Power On By Keyboard                   Disabled
    Power On Password
Power On By Mouse                      Disabled
ErP                                    Disabled

Platform Power Management              Disabled
```

```
Enables or Disables dummy load.When the
power supply is at low load, a
self-protection will activate causing
it to shutdown or fail.If this occurs,
please set to Enabled.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Power Loading

Enables or disables dummy load. When the power supply is at low load, a self-protection will activate causing it to shutdown or fail. If this occurs, please set to **Enabled**. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Resume by Alarm

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

- ⏩ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
- ⏩ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ Soft-Off by PWR-BTTN

Configures the way to turn off the computer in MS-DOS mode using the power button.

⏩ Instant-Off	Press the power button and then the system will be turned off instantly. (Default)
⏩ Delay 4 Sec.	Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ RC6(Render Standby)

Allows you to determine whether to let the onboard graphics enter standby mode to decrease power consumption. (Default: Enabled)

☞ AC BACK

Determines the state of the system after the return of power from an AC power loss.

⏩ Always Off	The system stays off upon the return of the AC power. (Default)
⏩ Always On	The system is turned on upon the return of the AC power.
⏩ Memory	The system returns to its last known awake state upon the return of the AC power.

Power On By Keyboard

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

▸▸ Disabled	Disables this function. (Default)
▸▸ Any Key	Press any key to turn on the system.
▸▸ Keyboard 98	Press POWER button on the Windows 98 keyboard to turn on the system.
▸▸ Password	Set a password with 1~5 characters to turn on the system.

Power On Password

Set the password when **Power On By Keyboard** is set to **Password**.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

Power On By Mouse

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

▸▸ Disabled	Disables this function. (Default)
▸▸ Move	Move the mouse to turn on the system.
▸▸ Double Click	Double click on left button on the mouse to turn on the system.

ErP

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

Platform Power Management

Enables or disables the Active State Power Management function (ASPM). (Default: Disabled)

PEG ASPM

Allows you to configure the ASPM mode for the device connected to the CPU PEG bus. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **Platform Power Management** is set to **Enabled**. (Default: Auto)

PCIe ASPM

Allows you to configure the ASPM mode for the device connected to Chipset's PCI Express bus. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **Platform Power Management** is set to **Enabled**. (Default: Auto)

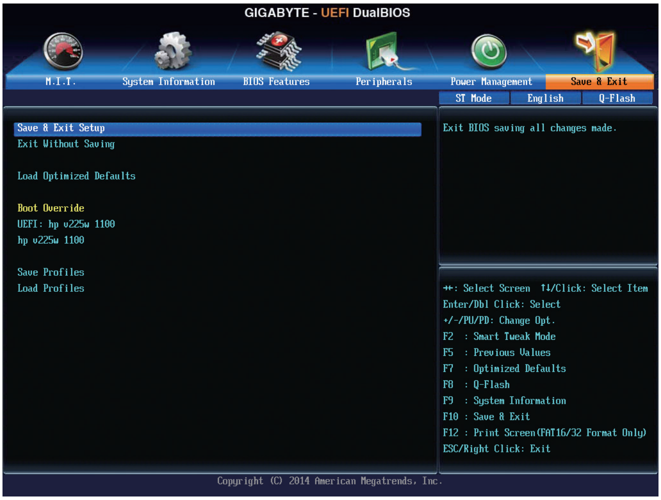
CPU DMI Link ASPM Control

Allows you to configure the ASPM mode for the CPU side of the DMI link. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **Platform Power Management** is set to **Enabled**. (Default:L0sL1)

PCH DMI Link ASPM Control

Allows you to configure the ASPM mode for both CPU side and Chipset side of the DMI link. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **Platform Power Management** is set to **Enabled**. (Default: Enabled)

2-8 Save & Exit



```
Save & Exit Setup
Exit Without Saving

Load Optimized Defaults

Boot Override
UEFI: hp v225w 1100
hp v225w 1100

Save Profiles
Load Profiles
```

```
Exit BIOS saving all changes made.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

```
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```

Save & Exit Setup

Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

Exit Without Saving

Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

Load Optimized Defaults

Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

Boot Override

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

Save Profiles

This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select **Select File in HDD/USB/FDD** to save the profile to your storage device.

Load Profiles

If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/USB/FDD** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).

Chapter 3 Configuring SATA Hard Drive(s)

RAID Levels

	RAID 0	RAID 1	RAID 5	RAID 10
Minimum Number of Hard Drives	≥2	2	≥3	≥4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives -1) * Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes	Yes

To configure SATA hard drive(s), follow the steps below:

A. Install SATA hard drive(s) in your computer.
B. Configure SATA controller mode in BIOS Setup.
C. Configure a RAID array in RAID BIOS. (Note 1)
D. Install the SATA RAID/AHCI driver and operating system. (Note 2)

Before you begin, please prepare the following items:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows setup disk.
- Motherboard driver disk.
- A USB thumb drive.

3-1 Configuring SATA Controllers

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.

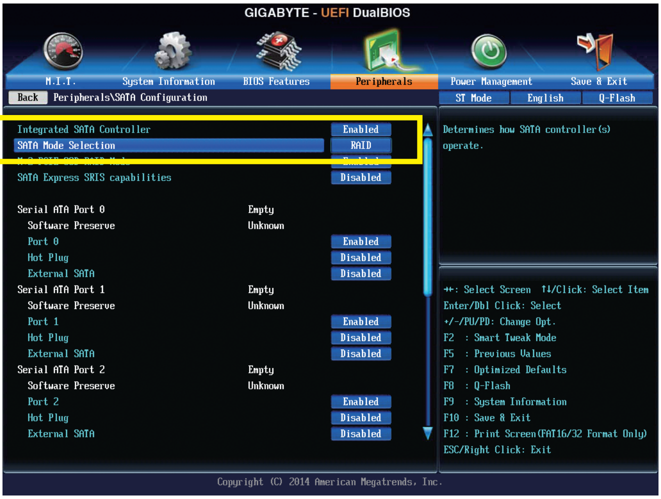
(Note 2) Required when the SATA controller is set to AHCI or RAID mode.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Go to **Peripherals\SATA Configuration**, make sure **Integrated SATA Controller** is enabled. To create RAID, set **SATA Mode Selection** to **RAID** (Figure 1). If you do not want to create RAID, set this item to **IDE** or **AHCI**.



```
Peripherals\SATA Configuration

Integrated SATA Controller                 Enabled
SATA Mode Selection                        RAID
M.2 PCIE SSD RAID Mode                     Enabled
SATA Express SRIS capabilities             Disabled

Serial ATA Port 0              Empty
  Software Preserve            Unknown
  Port 0                                   Enabled
  Hot Plug                                 Disabled
  External SATA                            Disabled
Serial ATA Port 1              Empty
  Software Preserve            Unknown
  Port 1                                   Enabled
  Hot Plug                                 Disabled
  External SATA                            Disabled
Serial ATA Port 2              Empty
  Software Preserve            Unknown
  Port 2                                   Enabled
  Hot Plug                                 Disabled
  External SATA                            Disabled

Determines how SATA controller(s)
operate.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

Figure 1

Step 2:

If you want to configure UEFI RAID, follow the steps in "C-1." To enter the legacy RAID ROM, save the settings and exit BIOS Setup. Refer to "C-2" for more information.

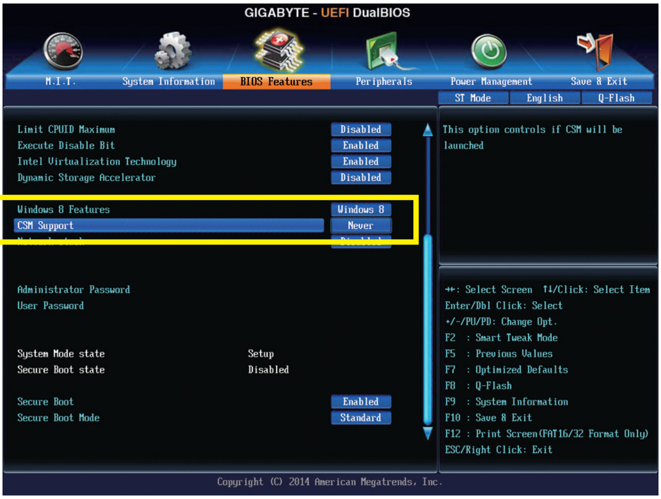
The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C-1. UEFI RAID Configuration

Only Windows 8.1/8 64-bit supports UEFI RAID configuration.

Step 1:

In BIOS Setup, go to **BIOS Features** and set **Windows 8 Features** to **Windows 8** and **CSM Support** to **Never** (Figure 2). Save the changes and exit BIOS Setup.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
ST Mode
English
Q-Flash

```
Limit CPUID Maximum                         Disabled
Execute Disable Bit                         Enabled
Intel Virtualization Technology             Enabled
Dynamic Storage Accelerator                 Disabled

Windows 8 Features                          Windows 8
CSM Support                                 Never


Administrator Password
User Password


System Mode state              Setup
Secure Boot state              Disabled

Secure Boot                                 Enabled
Secure Boot Mode                            Standard
```

```
This option controls if CSM will be
launched

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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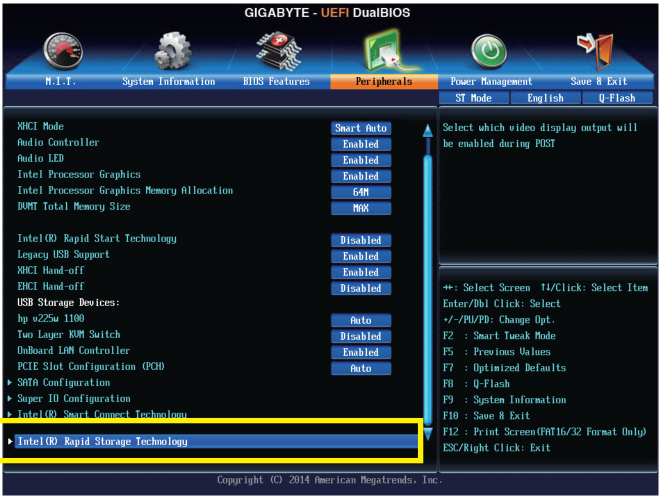
Figure 2

Step 2:

After the system reboot, enter BIOS Setup again. Then enter the **Peripherals\Intel(R) Rapid Storage Technology** sub-menu (Figure 3).


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
ST Mode
English
Q-Flash

```
XHCI Mode                                   Smart Auto
Audio Controller                            Enabled
Audio LED                                   Enabled
Intel Processor Graphics                    Enabled
Intel Processor Graphics Memory Allocation  64M
DVMT Total Memory Size                      MAX

Intel(R) Rapid Start Technology             Disabled
Legacy USB Support                          Enabled
XHCI Hand-off                               Enabled
EHCI Hand-off                               Disabled
USB Storage Devices:
hp v225w 1100                               Auto
Two Layer KVM Switch                        Disabled
OnBoard LAN Controller                      Enabled
PCIE Slot Configuration (PCH)               Auto
▸ SATA Configuration
▸ Super IO Configuration
▸ Intel(R) Smart Connect Technology

▸ Intel(R) Rapid Storage Technology
```

```
Select which video display output will
be enabled during POST

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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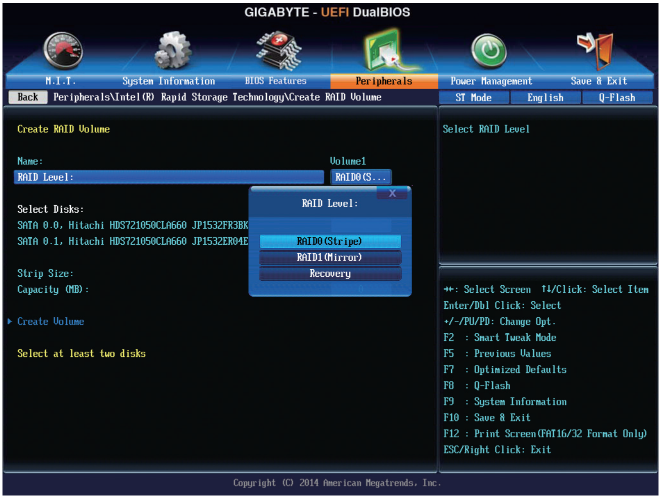
Figure 3

Step 3:

On the **Intel(R) Rapid Storage Technology** menu, press <Enter> on **Create RAID Volume** to enter the **Create RAID Volume** screen. Enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Next, use the down arrow key to move to **Select Disks**.

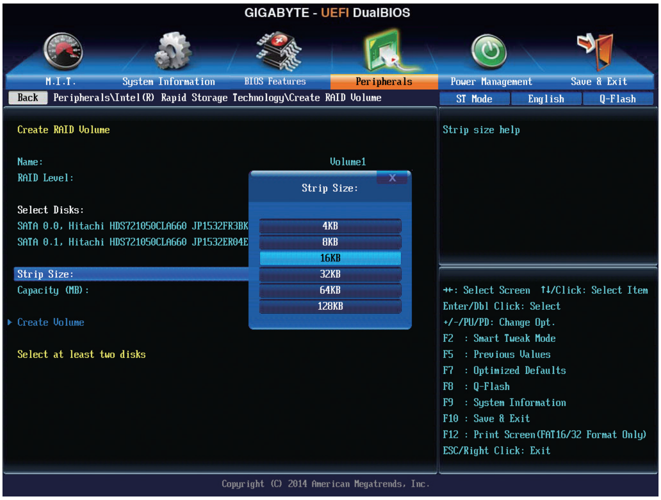

GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
ST Mode
English
Q-Flash
Copyright (C) 2014 American Megatrends, Inc.

```
Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume

Create RAID Volume

Name:                                        Volume1
RAID Level:                                  RAID0(S...

Select Disks:
SATA 0.0, Hitachi HDS721050CLA660 JP1532FR3BK
SATA 0.1, Hitachi HDS721050CLA660 JP1532ER04E

Strip Size:
Capacity (MB):

▸ Create Volume

Select at least two disks

RAID Level:
  RAID0(Stripe)
  RAID1(Mirror)
  Recovery

Select RAID Level

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

Figure 4

Step 4:

Under **Select Disks** item, select the hard drives to be included in the RAID array. Press the <Space> key on the hard drives to be selected (selected hard drives are marked with "X"). Then set the stripe block size (Figure 5). The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, set the volume capacity.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
ST Mode
English
Q-Flash
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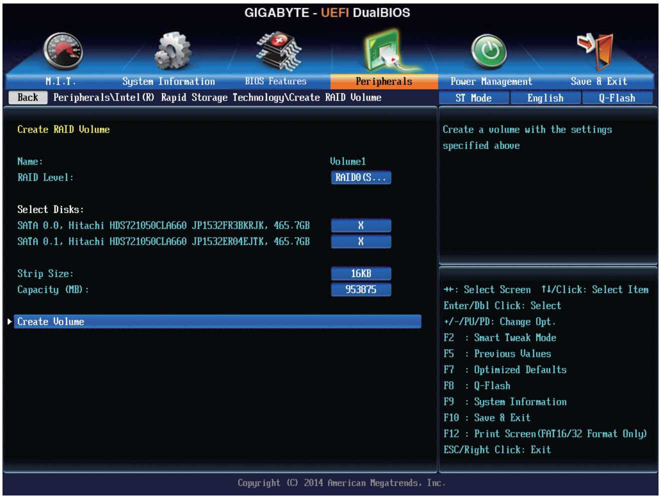
```
Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume

Create RAID Volume

Name:                                        Volume1
RAID Level:

Select Disks:
SATA 0.0, Hitachi HDS721050CLA660 JP1532FR3BK
SATA 0.1, Hitachi HDS721050CLA660 JP1532ER04E

Strip Size:
Capacity (MB):

▸ Create Volume

Select at least two disks

Strip Size:
  4KB
  8KB
  16KB
  32KB
  64KB
  128KB

Strip size help

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

Figure 5

Step 5:

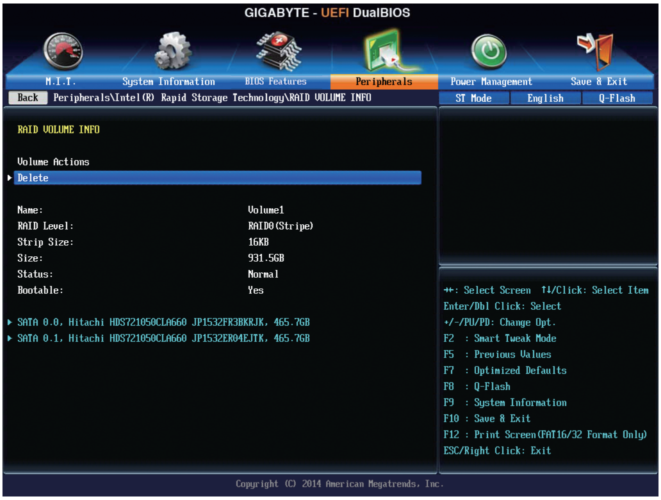
After setting the capacity, move to **Create Volume** and press <Enter> to begin. (Figure 6)


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
ST Mode
English
Q-Flash

```
Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume

Create RAID Volume

Name:                                                        Volume1
RAID Level:                                                  RAID0(S...

Select Disks:
SATA 0.0, Hitachi HDS721050CLA660 JP1532FR3BKRJK, 465.7GB    X
SATA 0.1, Hitachi HDS721050CLA660 JP1532ER04EJTK, 465.7GB    X

Strip Size:                                                  16KB
Capacity (MB):                                               953875

▶ Create Volume

Create a volume with the settings
specified above

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

Copyright (C) 2014 American Megatrends, Inc.
```

Figure 6

After completing, you'll be brought back to the **Intel(R) Rapid Storage Technology** screen. Under **RAID Volumes** you can see the new RAID volume. To see more detailed information, press <Enter> on the volume to check for information on RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)

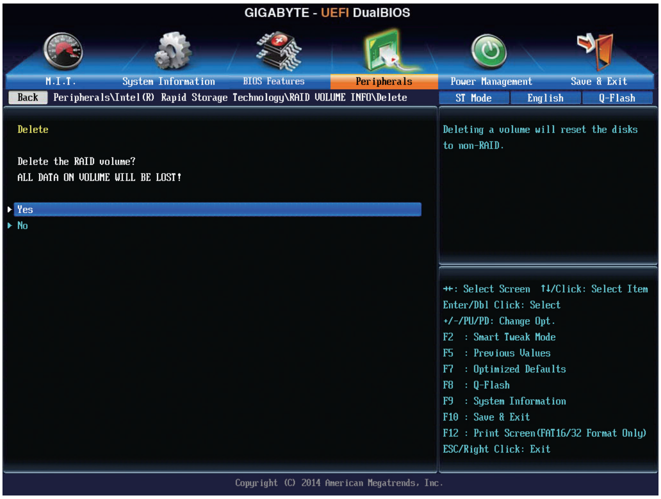

GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
ST Mode
English
Q-Flash

```
Peripherals\Intel(R) Rapid Storage Technology\RAID VOLUME INFO

RAID VOLUME INFO

Volume Actions
▶ Delete

Name:                                   Volume1
RAID Level:                             RAID0(Stripe)
Strip Size:                             16KB
Size:                                   931.5GB
Status:                                 Normal
Bootable:                               Yes

▶ SATA 0.0, Hitachi HDS721050CLA660 JP1532FR3BKRJK, 465.7GB
▶ SATA 0.1, Hitachi HDS721050CLA660 JP1532ER04EJTK, 465.7GB

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

Copyright (C) 2014 American Megatrends, Inc.
```

Figure 7

Delete RAID Volume

To delete a RAID array, press <Enter> on the volume to be deleted on the **Intel(R) Rapid Storage Technology** screen. After entering the **RAID VOLUME INFO** screen, press <Enter> on **Delete** to enter the **Delete** screen. Press <Enter> on **Yes** (Figure 8).


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Peripherals\Intel(R) Rapid Storage Technology\RAID VOLUME INFO\Delete
ST Mode
English
Q-Flash
Yes
No

Delete

Delete the RAID volume?
ALL DATA ON VOLUME WILL BE LOST!

Deleting a volume will reset the disks to non-RAID.

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Smart Tweak Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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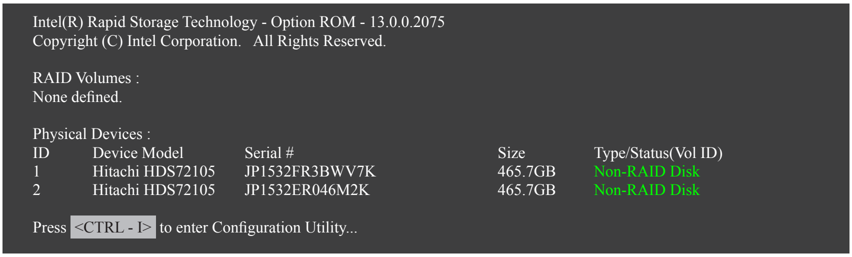
Figure 8

C-2. Configuring Legacy RAID ROM

Enter the Intel® legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 9). Press <Ctrl> + <I> to enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C) Intel Corporation.   All Rights Reserved.

RAID Volumes :
None defined.

Physical Devices :
ID      Device Model        Serial #                       Size        Type/Status(Vol ID)
1       Hitachi HDS72105    JP1532FR3BWV7K                 465.7GB     Non-RAID Disk
2       Hitachi HDS72105    JP1532ER046M2K                 465.7GB     Non-RAID Disk

Press <CTRL - I> to enter Configuration Utility...
```

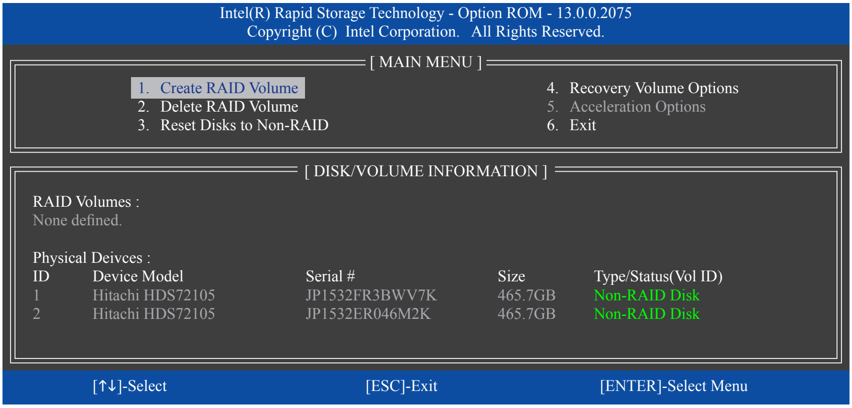
Figure 9

Step 2:

After you press <Ctrl> + <I>, the **MAIN MENU** screen will appear (Figure 10).

Create RAID Volume

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

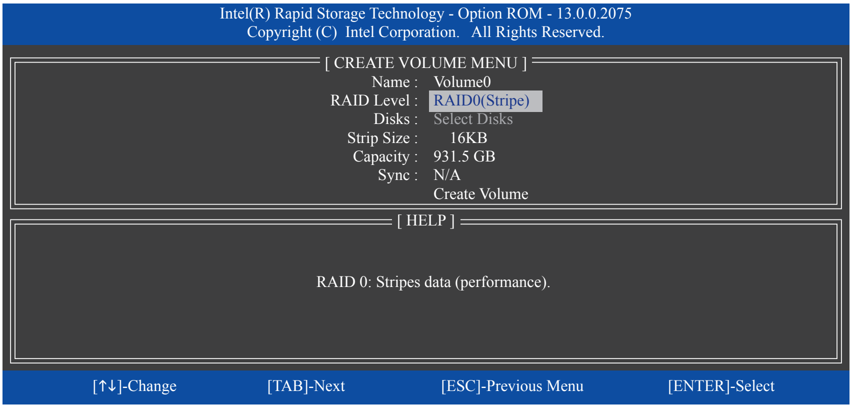


```
              Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
                   Copyright (C)  Intel Corporation.   All Rights Reserved.

                                   [ MAIN MENU ]
            1.  Create RAID Volume                        4.  Recovery Volume Options
            2.  Delete RAID Volume                        5.  Acceleration Options
            3.  Reset Disks to Non-RAID                   6.  Exit

                            [ DISK/VOLUME INFORMATION ]
RAID Volumes :
None defined.

Physical Deivces :
ID      Device Model            Serial #               Size        Type/Status(Vol ID)
1       Hitachi HDS72105        JP1532FR3BWV7K         465.7GB     Non-RAID Disk
2       Hitachi HDS72105        JP1532ER046M2K         465.7GB     Non-RAID Disk

        [↑↓]-Select                [ESC]-Exit                [ENTER]-Select Menu
```

Figure 10

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 11). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

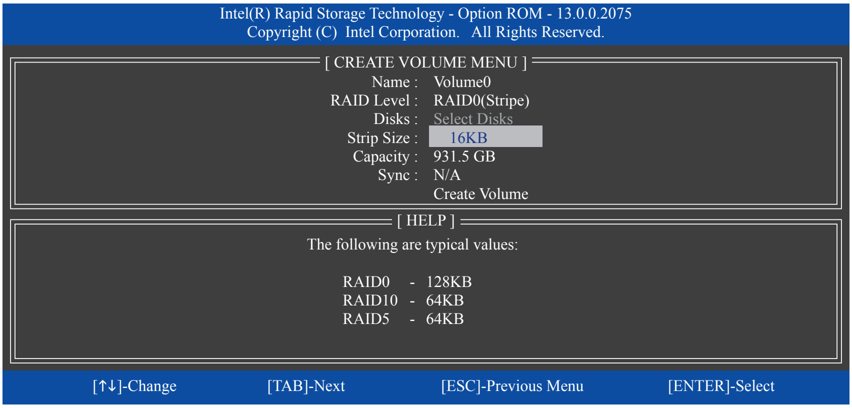


```
        Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
          Copyright (C)  Intel Corporation.   All Rights Reserved.

                      [ CREATE VOLUME MENU ]
                     Name :   Volume0
               RAID Level :   RAID0(Stripe)
                    Disks :   Select Disks
               Strip Size :      16KB
                 Capacity :   931.5 GB
                     Sync :   N/A
                              Create Volume

                              [ HELP ]

                  RAID 0: Stripes data (performance).

[↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [ENTER]-Select
```

Figure 11

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 12) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

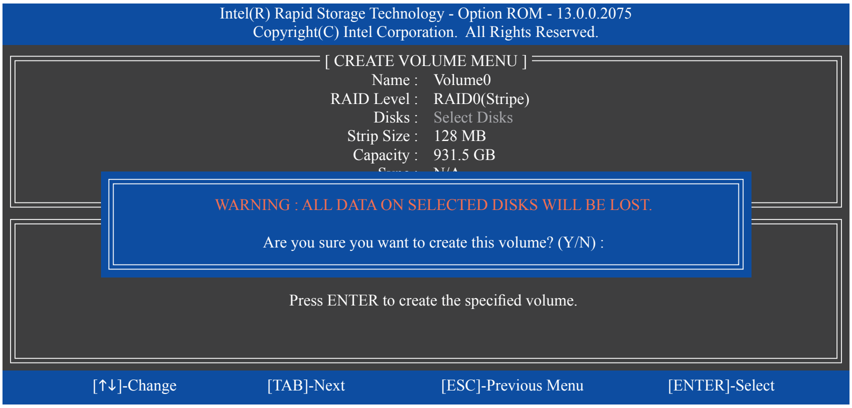


```
        Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
          Copyright (C)  Intel Corporation.   All Rights Reserved.

                      [ CREATE VOLUME MENU ]
                     Name :   Volume0
               RAID Level :   RAID0(Stripe)
                    Disks :   Select Disks
               Strip Size :      16KB
                 Capacity :   931.5 GB
                     Sync :   N/A
                              Create Volume

                              [ HELP ]
                   The following are typical values:

                        RAID0     -  128KB
                        RAID10   -  64KB
                        RAID5     -  64KB

[↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [ENTER]-Select
```

Figure 12

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 13).



Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright(C) Intel Corporation. All Rights Reserved.

[CREATE VOLUME MENU]

Name : Volume0
RAID Level : RAID0(Stripe)
Disks : Select Disks
Strip Size : 128 MB
Capacity : 931.5 GB

WARNING : ALL DATA ON SELECTED DISKS WILL BE LOST.

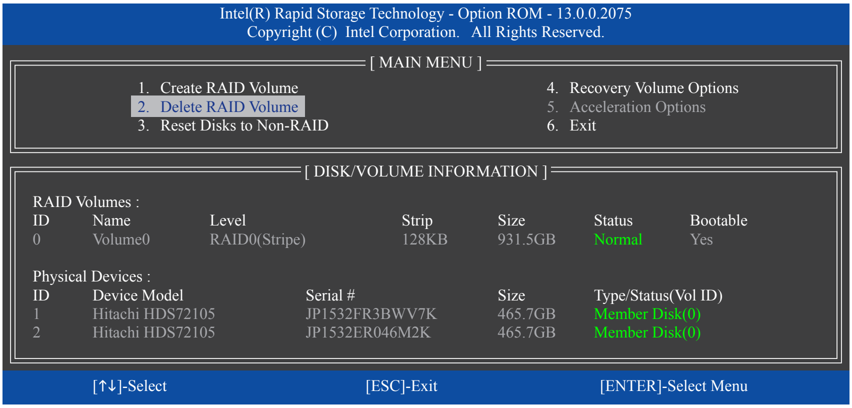
Are you sure you want to create this volume? (Y/N) :

Press ENTER to create the specified volume.

[↑↓]-Change
[TAB]-Next
[ESC]-Previous Menu
[ENTER]-Select

Figure 13

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 14)



Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C) Intel Corporation. All Rights Reserved.

[MAIN MENU]

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Recovery Volume Options
5. Acceleration Options
6. Exit

[DISK/VOLUME INFORMATION]

RAID Volumes :

ID	Name	Level	Strip	Size	Status	Bootable
0	Volume0	RAID0(Stripe)	128KB	931.5GB	Normal	Yes

Physical Devices :

ID	Device Model	Serial #	Size	Type/Status(Vol ID)
1	Hitachi HDS72105	JP1532FR3BWV7K	465.7GB	Member Disk(0)
2	Hitachi HDS72105	JP1532ER046M2K	465.7GB	Member Disk(0)

[↑↓]-Select
[ESC]-Exit
[ENTER]-Select Menu

Figure 14

To exit the RAID BIOS utility, press <Esc> or select **6. Exit** in **MAIN MENU**.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

Recovery Volume Options

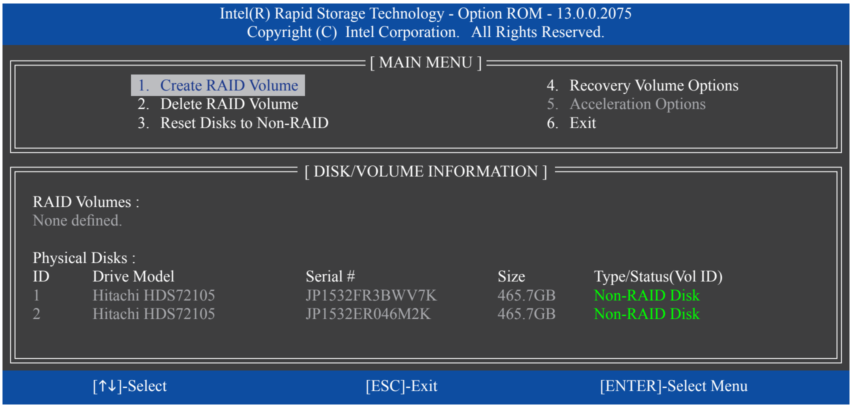
Intel® Rapid Recover Technology provides data protection by allowing users to easily restore data and system operation using a designated recovery drive. With the Rapid Recovery Technology, which employs RAID 1 functionality, users can copy the data from the master drive to the recovery drive; if needed, the data on the recovery drive can be restored back to the master drive.

Before you begin:

- The recovery drive must have equal or greater capacity than the master drive.
- A recovery volume can be created with two hard drives only. A recovery volume and a RAID array cannot co-exist in the system at the same time, that is, if you have already created a recovery volume, you are unable to create a RAID array.
- By default, only the master drive can be viewed in the operating system; the recovery drive is hidden.

Step 1:

Select **Create RAID Volume** in **MAIN MENU** and press <Enter> (Figure 15).

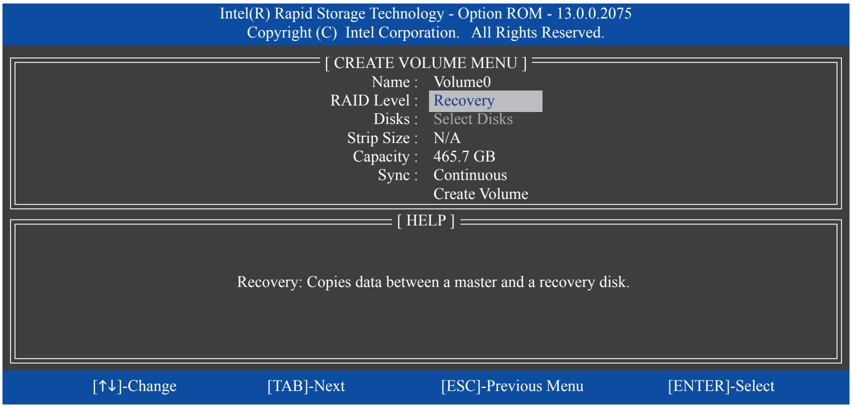


```
        Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
             Copyright (C)  Intel Corporation.   All Rights Reserved.

                              [ MAIN MENU ]
        1.  Create RAID Volume                  4.  Recovery Volume Options
        2.  Delete RAID Volume                  5.  Acceleration Options
        3.  Reset Disks to Non-RAID             6.  Exit

                       [ DISK/VOLUME INFORMATION ]
 RAID Volumes :
 None defined.

 Physical Disks :
 ID    Drive Model          Serial #            Size       Type/Status(Vol ID)
 1     Hitachi HDS72105     JP1532FR3BWV7K      465.7GB    Non-RAID Disk
 2     Hitachi HDS72105     JP1532ER046M2K      465.7GB    Non-RAID Disk

      [↑↓]-Select              [ESC]-Exit              [ENTER]-Select Menu
```

Figure 15

Step 2:

After entering the volume name, select **Recovery** under the **RAID Level** item and press <Enter> (Figure 16).

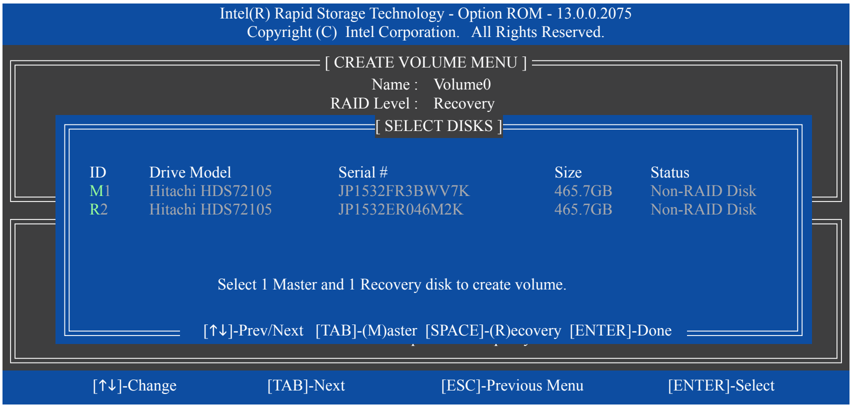


```
        Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
             Copyright (C)  Intel Corporation.   All Rights Reserved.

                          [ CREATE VOLUME MENU ]
                          Name :  Volume0
                    RAID Level :  Recovery
                         Disks :  Select Disks
                     Strip Size :  N/A
                      Capacity :  465.7 GB
                          Sync :  Continuous
                                  Create Volume

                                [ HELP ]

           Recovery: Copies data between a master and a recovery disk.

   [↑↓]-Change      [TAB]-Next       [ESC]-Previous Menu      [ENTER]-Select
```

Figure 16

Step 3:

Press <Enter> under the **Select Disks** item. In the **SELECT DISKS** box, press <Tab> on the hard drive you want to use for the master drive and press <Space> on the hard drive you want to use for the recovery drive. (Make sure the recovery drive has equal or larger capacity than the master drive.) Then press <Enter> to confirm (Figure 17).

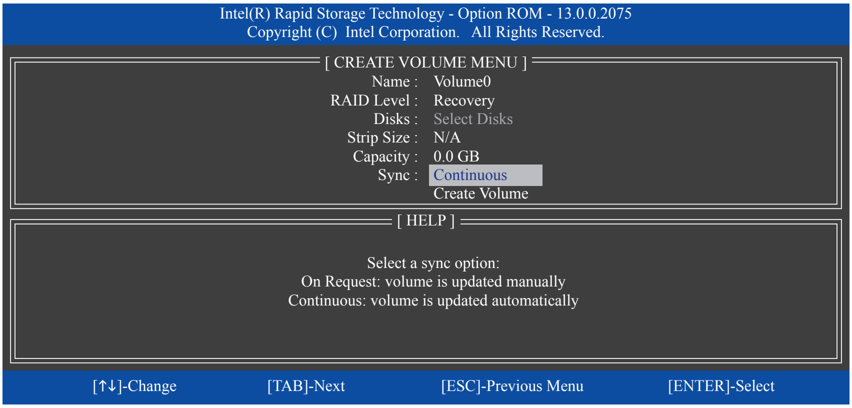


```
          Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
              Copyright (C)  Intel Corporation.   All Rights Reserved.

                         [ CREATE VOLUME MENU ]
                               Name :    Volume0
                         RAID Level :    Recovery
                           [ SELECT DISKS ]

   ID     Drive Model          Serial #                Size        Status
   M1     Hitachi HDS72105     JP1532FR3BWV7K          465.7GB     Non-RAID Disk
   R2     Hitachi HDS72105     JP1532ER046M2K          465.7GB     Non-RAID Disk

              Select 1 Master and 1 Recovery disk to create volume.

      [↑↓]-Prev/Next   [TAB]-(M)aster  [SPACE]-(R)ecovery  [ENTER]-Done

   [↑↓]-Change        [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

Figure 17

Step 4:

Under **Sync**, select **Continuous** or **On Request** (Figure 18). When set to **Continuous**, changes made to the data on the master drive will be automatically and continuously copied to the recovery drive when both hard drives are installed in the system. **On Request** allows users to update data from the master drive to the recovery drive manually using the Intel® Rapid Storage Technology utility in the operating system. **On Request** also allows users to restore the master drive to a previous state.



```
          Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
              Copyright (C)  Intel Corporation.   All Rights Reserved.

                         [ CREATE VOLUME MENU ]
                               Name :    Volume0
                         RAID Level :    Recovery
                              Disks :    Select Disks
                         Strip Size :    N/A
                           Capacity :    0.0 GB
                               Sync :    Continuous
                                         Create Volume

                               [ HELP ]

                          Select a sync option:
                  On Request: volume is updated manually
                Continuous: volume is updated automatically

   [↑↓]-Change        [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

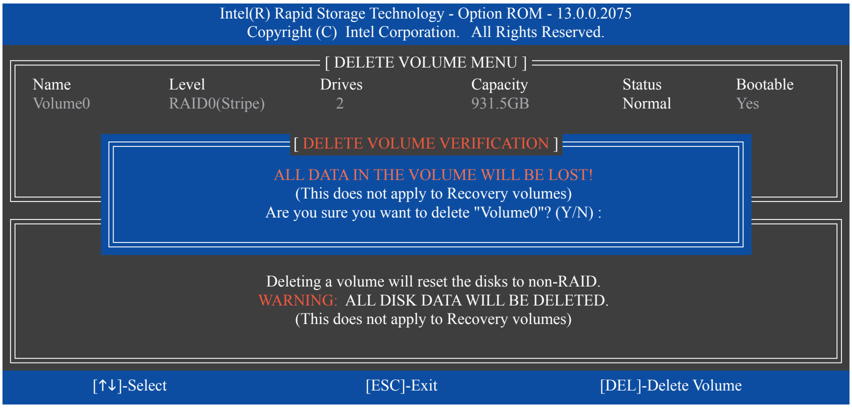
Figure 18

Step 5:

Finally press <Enter> on the **Create Volume** item to begin creating the Recovery Volume and follow the on-screen instructions to complete.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 19), press <Y> to confirm or <N> to abort.



Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C) Intel Corporation. All Rights Reserved.

[DELETE VOLUME MENU]

Name	Level	Drives	Capacity	Status	Bootable
Volume0	RAID0(Stripe)	2	931.5GB	Normal	Yes

[DELETE VOLUME VERIFICATION]

ALL DATA IN THE VOLUME WILL BE LOST!
(This does not apply to Recovery volumes)
Are you sure you want to delete "Volume0"? (Y/N) :

Deleting a volume will reset the disks to non-RAID.
WARNING: ALL DISK DATA WILL BE DELETED.
(This does not apply to Recovery volumes)

Figure 19

Acceleration Options

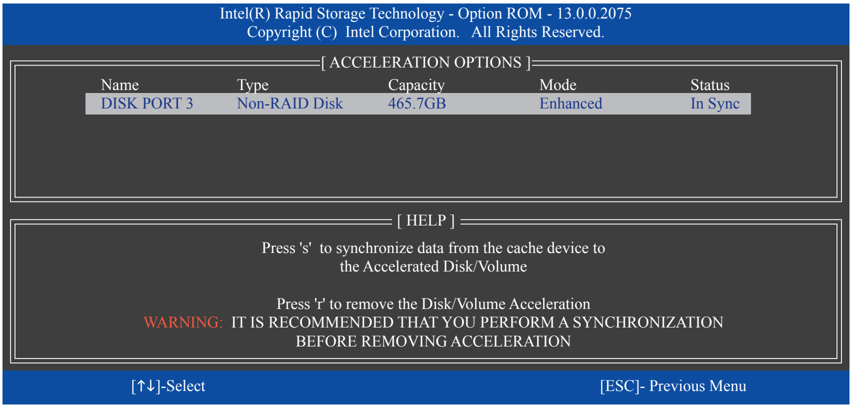
This option allows you to view the status of your accelerated drive/volume (Figure 20) created using the Intel® IRST utility. In case you are unable to run the Intel® IRST utility due to an application error or operating system issue, you will need to remove acceleration or manually enable synchronization (Maximized mode only) using this option in the RAID ROM utility.

Steps:

Select **Acceleration Options** in **MAIN MENU** and press <Enter>.

To remove the acceleration, select the accelerated drive/volume, press <R>, and press <Y> to confirm.

To synchronize data from the cache device to the accelerated drive/volume, press <S> and press <Y> to confirm.



Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C) Intel Corporation. All Rights Reserved.

[ACCELERATION OPTIONS]

Name	Type	Capacity	Mode	Status
DISK PORT 3	Non-RAID Disk	465.7GB	Enhanced	In Sync

[HELP]

Press 's' to synchronize data from the cache device to
the Accelerated Disk/Volume

Press 'r' to remove the Disk/Volume Acceleration
WARNING: IT IS RECOMMENDED THAT YOU PERFORM A SYNCHRONIZATION
BEFORE REMOVING ACCELERATION

Figure 20

3-2 Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.

A. Installing the Operating System

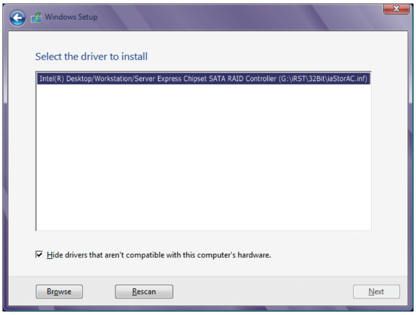
As Windows 7 already include Intel® SATA RAID/AHCI driver, you do not need to install separate RAID/AHCI driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disk using "Xpress Install" to ensure system performance and compatibility. To install Windows 8.1/8, refer to the steps below:

Step 1:
Copy the **IRST** folder under **BootDrv** in the driver disk to your USB thumb drive.

Step 2:
Boot from the Windows 8.1/8 setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:
Insert the USB thumb drive and then browse to the location of the driver. The locations of the drivers are as follows:
Windows 32-bit: \iRST\32Bit
Windows 64-bit: \iRST\64Bit

Step 4:
When a screen as shown in Figure 1 appears, select **Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller** and click **Next** to load the driver and continue the OS installation



Select the driver to install

Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller (G:\iRST\32Bit\iaStorAC.inf)

☑ Hide drivers that aren't compatible with this computer's hardware.

Figure 1

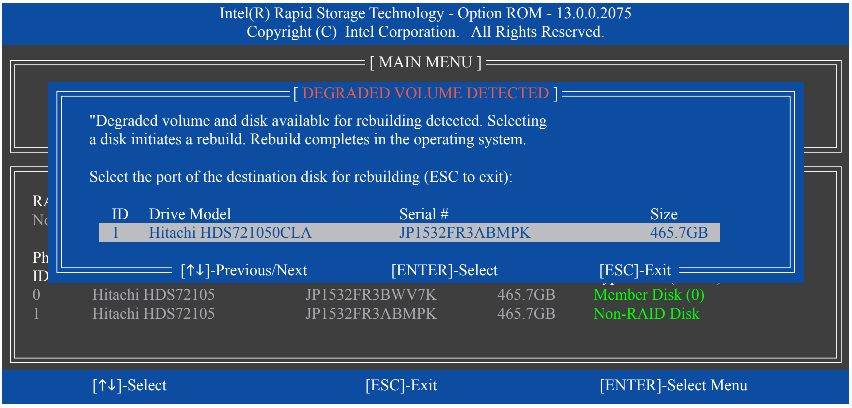
B. Rebuilding an Array

Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

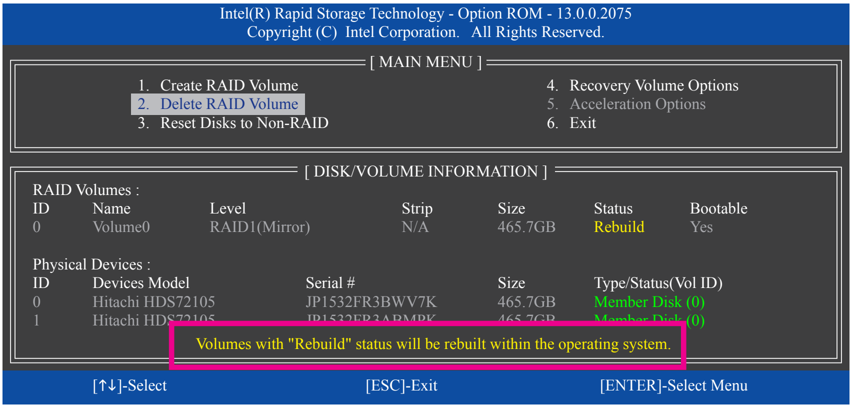
- **Enabling Automatic Rebuild**

Step 1:
When the message "Press <Ctrl-I> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C)  Intel Corporation.   All Rights Reserved.

[ MAIN MENU ]

[ DEGRADED VOLUME DETECTED ]

"Degraded volume and disk available for rebuilding detected. Selecting
a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):

ID   Drive Model                    Serial #                   Size
1    Hitachi HDS721050CLA           JP1532FR3ABMPK             465.7GB

[↑↓]-Previous/Next          [ENTER]-Select          [ESC]-Exit

0      Hitachi HDS72105        JP1532FR3BWV7K      465.7GB     Member Disk (0)
1      Hitachi HDS72105        JP1532FR3ABMPK      465.7GB     Non-RAID Disk

[↑↓]-Select                    [ESC]-Exit                [ENTER]-Select Menu
```

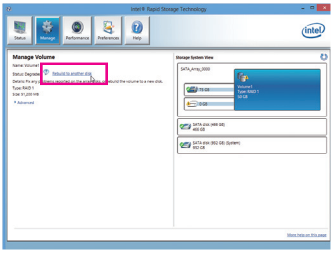
Step 2:
Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system. If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).



```
Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
Copyright (C)  Intel Corporation.   All Rights Reserved.

[ MAIN MENU ]
   1.  Create RAID Volume                  4.  Recovery Volume Options
   2.  Delete RAID Volume                  5.  Acceleration Options
   3.  Reset Disks to Non-RAID             6.  Exit

[ DISK/VOLUME INFORMATION ]
RAID Volumes :
ID     Name        Level             Strip     Size       Status     Bootable
0      Volume0     RAID1(Mirror)     N/A       465.7GB    Rebuild    Yes

Physical Devices :
ID     Devices Model           Serial #            Size        Type/Status(Vol ID)
0      Hitachi HDS72105        JP1532FR3BWV7K      465.7GB     Member Disk (0)
1      Hitachi HDS72105        JP1532FR3ABMPK      465.7GB     Member Disk (0)
     Volumes with "Rebuild" status will be rebuilt within the operating system.

[↑↓]-Select                    [ESC]-Exit                [ENTER]-Select Menu
```

- **Performing the Rebuild in the Operating System**

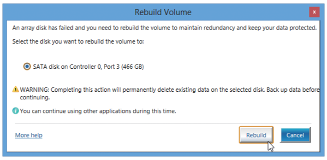
While in the operating system, make sure the chipset driver has been installed from the motherboard driver disk. Then launch the Intel® Rapid Storage Technology utility from the desktop.


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Manage Volume
Rebuild to another disk
Advanced
Storage System View
SATA_Array_0000
75 GB
0 GB
Volume1
Type: RAID 1
50 GB
SATA disk (466 GB)
466 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Name: Volume1
Status: Degraded
Type: RAID 1
Size: 51,200 MB

Step 1:

Go to the **Manage** menu and click **Rebuild to another disk** in **Manage Volume**.


Rebuild Volume
More help
Rebuild
Cancel

An array disk has failed and you need to rebuild the volume to maintain redundancy and keep your data protected.

Select the disk you want to rebuild the volume to:

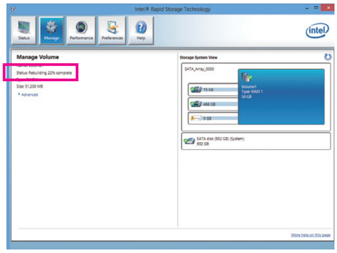
● SATA disk on Controller 0, Port 3 (466 GB)

WARNING: Completing this action will permanently delete existing data on the selected disk. Back up data before continuing.

You can continue using other applications during this time.

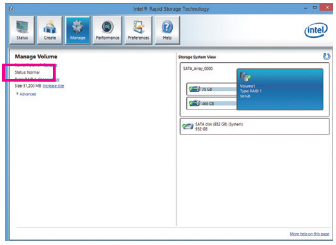
Step 2:

Select a new drive to rebuild the RAID and click **Rebuild**.


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Manage Volume
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
0 GB
Volume1
Type: RAID 1
50 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Status: Rebuilding 22% complete
Size: 51,200 MB

The **Status** item on the left of the screen displays the rebuild progress.


Intel® Rapid Storage Technology
Status
Create
Manage
Performance
Preferences
Help
intel
Manage Volume
Increase size
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
Volume1
Type: RAID 1
50 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Status: Normal
Size: 51,200 MB

Step 3:

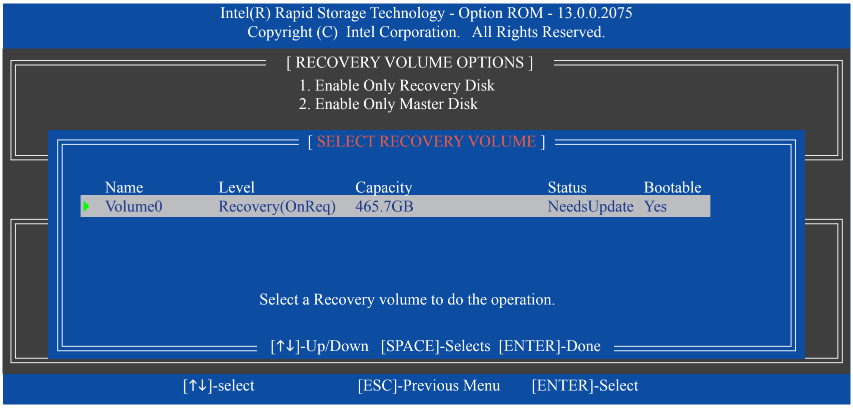
After the RAID 1 volume rebuilding, the **Status** will display as **Normal**.

- **Restoring the Master Drive to a Previous State (for Recovery Volume only)**

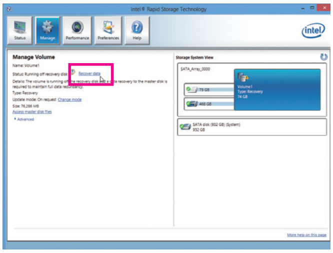
When two hard drives are set to Recovery Volume in Update on Request mode, you can restore the master drive data to the last backup state when needed. For example, in case the master drive detects a virus, you can restore the recovery drive data to the master drive.

Step 1:

Select **4. Recovery Volume Options** in the **MAIN MENU** of the Intel® RAID Configuration Utility. On the **RECOVERY VOLUMES OPTIONS** menu, select **Enable Only Recovery Disk** to show the recovery drive in the operating system. Follow the on-screen instructions to complete and exit the RAID Configuration Utility.



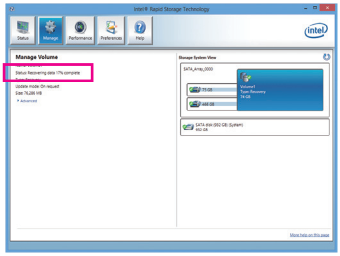
```
            Intel(R) Rapid Storage Technology - Option ROM - 13.0.0.2075
              Copyright (C)  Intel Corporation.   All Rights Reserved.

                        [ RECOVERY VOLUME OPTIONS ]
                          1. Enable Only Recovery Disk
                          2. Enable Only Master Disk

                        [ SELECT RECOVERY VOLUME ]

     Name          Level             Capacity            Status        Bootable
   ▶ Volume0       Recovery(OnReq)   465.7GB             NeedsUpdate   Yes

                 Select a Recovery volume to do the operation.

          [↑↓]-Up/Down   [SPACE]-Selects  [ENTER]-Done

        [↑↓]-select              [ESC]-Previous Menu       [ENTER]-Select
```


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Manage Volume
Recover data
Storage System View
SATA_Array_0000
75 GB
466 GB
Volume1
Type: Recovery
74 GB
SATA disk (932 GB) (System)
932 GB

Name: Volume1
Status: Running off recovery disk
Details: The volume is running off the recovery disk and a data recovery to the master disk is required to maintain full data redundancy.
Type: Recovery
Update mode: On request Change mode
Size: 76,286 MB
Access master disk files

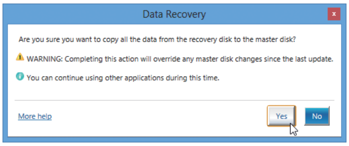
Step 2:

Go to the **Manage** menu of the Intel® Rapid Storage Technology utility and click **Recover data** in **Manage Volume**.


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Manage Volume
Advanced
Storage System View
SATA_Array_0000

Status: Recovering data 17% complete
Update mode: On request
Size: 76,286 MB

The **Status** item on the left of the screen displays the rebuild progress.


Data Recovery
More help
Yes
No

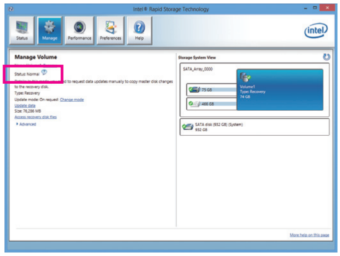
Are you sure you want to copy all the data from the recovery disk to the master disk?

⚠ WARNING: Completing this action will override any master disk changes since the last update.

You can continue using other applications during this time.

Step 3:

Click **Yes** to begin the data recovery.


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Manage Volume
Advanced
Storage System View

Status: Normal
Type: Recovery
Update mode: On request Change mode
Update data
Size: 76,286 MB
Access recovery disk files

Step 4:

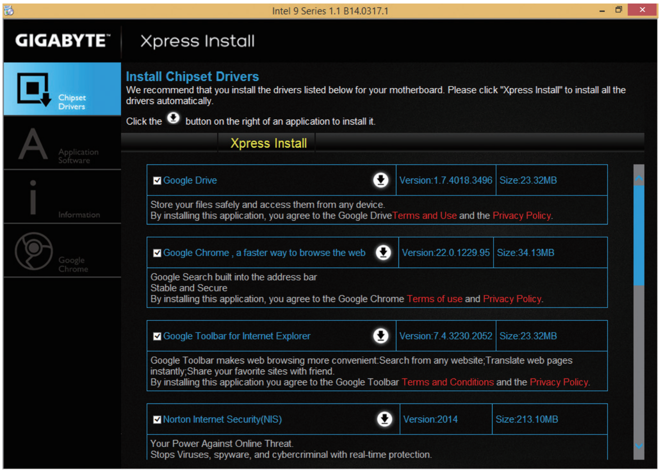
After the recovery volume is completed, the **Status** will display as **Normal**.

Chapter 4 Appendix

Drivers Installation

- Before installing the drivers, first install the operating system. (The following instructions use Windows 8.1 as the example operating system.)
- After installing the operating system, insert the motherboard driver disk into your optical drive. Click on the message "Tap to choose what happens with this disc" on the top-right corner of the screen and select "Run **Run**.exe." (Or go to My Computer, double-click the optical drive and execute the **Run**.exe program.)

"Xpress Install" will automatically scan your system and then list all of the drivers that are recommended to install. You can click the **Xpress Install** button and "Xpress Install" will install all of the selected drivers. Or click the arrow ⬇ icon to individually install the drivers you need.



Install Chipset Drivers

We recommend that you install the drivers listed below for your motherboard. Please click "Xpress Install" to install all the drivers automatically.

Click the ⬇ button on the right of an application to install it.

☑ Google Drive ⬇ Version:1.7.4018.3496 Size:23.32MB
Store your files safely and access them from any device.
By installing this application, you agree to the Google DriveTerms and Use and the Privacy Policy.

☑ Google Chrome , a faster way to browse the web ⬇ Version:22.0.1229.95 Size:34.13MB
Google Search built into the address bar
Stable and Secure
By installing this application, you agree to the Google Chrome Terms of use and Privacy Policy.

☑ Google Toolbar for Internet Explorer ⬇ Version:7.4.3230.2052 Size:23.32MB
Google Toolbar makes web browsing more convenient:Search from any website;Translate web pages instantly;Share your favorite sites with friend.
By installing this application you agree to the Google Toolbar Terms and Conditions and the Privacy Policy.

☑ Norton Internet Security(NIS) ⬇ Version:2014 Size:213.10MB
Your Power Against Online Threat.
Stops Viruses, spyware, and cybercriminal with real-time protection.

For more software information, please visit GIGABYTE's website.

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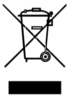
WEEE Symbol Statement



The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or experienced TV/radio technician for help.

Canada, Industry Canada (IC) Notices / Canada, avis d'Industry Canada (IC)

- This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.
- Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

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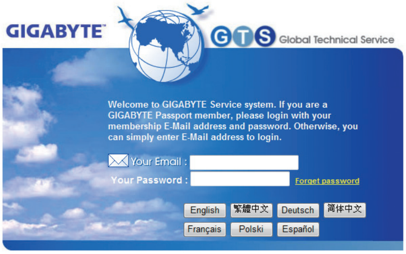

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Then select your language to enter the system.